JANUARY 1951

The Paper Industry

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JAN 26 1951
DETROIT

CURLATION will upgrade pulp

and...

Save Pulpwood
Save Coal
Save Sulphur
Save Limestone

CURLATION of No. 1 sulphite pulp will

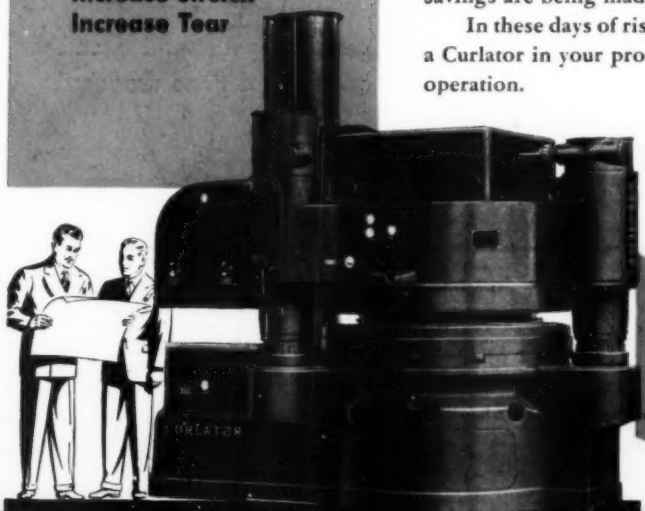
Increase Cleanliness
Increase Softness
Increase Porosity
Increase Stretch
Increase Tear

***Now,* with our Curlator we actually transform glorified screenings into quality pulp!**

Before the advent of Curlation there were three grades of pulps: No. 1 sulphite, No. 2 sulphite and fine screenings. *Now* with Curlation there is only *one* grade—*No. 1 sulphite.* Curlation has converted No. 2 sulphite and fine screen rejects into No. 1 sulphite pulp.

Thus the pulp has been upgraded with an increased sales value. Also the yield of No. 1 sulphite has been increased. In addition, savings are being made in coal, limestone and sulphur.

In these days of rising costs and material scarcity the inclusion of a Curlator in your production line is of topmost importance in mill operation.



WRITE today for more detailed information on what a Curlator can do for you.

CURLATOR* Corporation

545 BLOSSOM ROAD · ROCHESTER 10, NEW YORK

*T.M. Reg — Curlator Corporation, Rochester, N. Y.

THE FUTURE OF YOUR PRODUCT IS IN THESE HANDS

wet-strengthen your paper with the UFORMITE resins

What happens to the housewife's temper—*and* the paper-maker's market—when moisture disintegrates waxed paper?

You know the answer. And here's the remedy. Whether you make waxed paper from bleached sulfite or bleached Kraft, as little as 1% UFORMITE 471 will boost wet strength to 22% of dry—will prevent waxed paper from becoming sopping shreds.

Food wraps, bags, towels, reproduction or printing papers, glassine and twisting tissues—the UFORMITE resins wet-strengthen them all. Tell us about your furnish, and we'll send you full details and samples of these urea formaldehyde resins.

OTHER CHEMICALS FOR THE PAPER INDUSTRY

RHOZYMES BB and E-5—for enzyme conversion of starch.

TAMOL N—for effective pitch control—a dispersing agent for pigments.

TRITONS—surface-active agents that increase absorbency and softness, stop foaming, rewet gummed tape.

The Hydrosulfites—reducing agents for stripping color from rag stock or for bleaching pulp.

HYAMINES—deodorants for paperboard and bactericides for glue.

UFORMITE, RHOZYME, TAMOL, TRITON *are trade-marks, Reg. U.S. Pat. Off. and in principal foreign countries.*

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

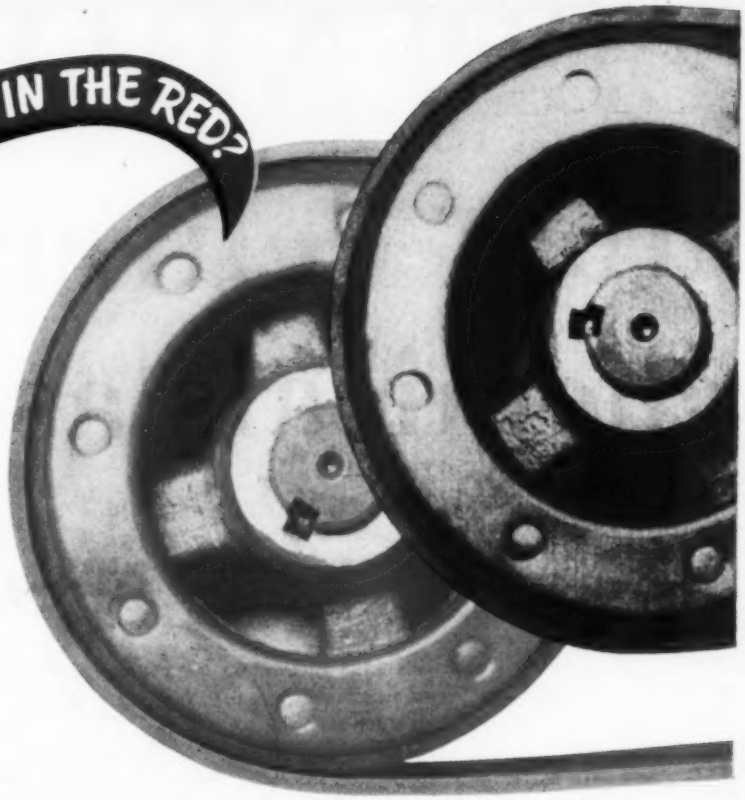
THE RESINOUS PRODUCTS DIVISION

Washington Square Philadelphia 5, Pa.

The Resinous Products Division was formerly The Resinous Products & Chemical Company

*T. M. Reg — Curlator Corporation, Rochester, N. Y.

IS YOUR BELT DRIVE IN THE RED?



These high-speed photographs stop the action of this 6" crowned pulley at 600 RPM. The *black* photo shows a G&K RESEARCH 2-ply leather belt. *Note that the edge of the belt is snug with the face of the pulley, proving full surface contact.*

The *red* photo, taken under identical conditions with a standard 2-ply oak tanned belt, *shows the edge of the belt away from the face of the pulley, proving that this belt is riding the crown.*

IT WAS... until I Got Graton & Knight Engineered Leather Belting—

Now, I'll show you some really modern power transmission drives, *and they're all leather!*

But they're not ordinary leather, for each has been *engineered* by Graton & Knight to meet conditions in my plant.

* * *

A belt should run like the fluid drive in your automobile: pull the load without slipping, but also absorb starting torque and load shock in order to protect your motors and machines.

Flat leather belting, as engineered by Graton & Knight performs this two-fold job better than any other material. Leather's unique fibre structure (which cannot be duplicated) has a natural resilience and a high coefficient of friction—which actually improve with age.

At Graton & Knight Company your leather belt starts with selection of the hide from a muti-million dollar inventory. It develops through scientific tanning and processing to provide in all belting this *live traction* — plus other required qualities to give you more production-power, less down-time and longer belt life on every drive.

An experienced G&K Man is ready to go over your toughest drive. Let us prove to you that *you can drive it better with a G&K Engineered Leather Belt.*

GRATON & KNIGHT COMPANY
WORCESTER, MASSACHUSETTS

RESEARCH®
Special tanning and currying insure highest coefficient of friction, great flexibility and resilience with minimum permanent stretch. Tension cemented. Ideal on short centers.

PREMIUM RESEARCH QUALITY

HEART OAK
Top grade center stock oak tannage and currying. Good friction surface, lateral firmness. Tension cemented. Famous general purpose belting—ideal for step-cone and shifter drives.

HEART OAK

SPARTAN®
Special quality combination tannage and currying. High friction surface, with great flexibility and minimum stretch. Tension cemented. Waterproof—resists steam, oil, acid and alkali fumes . . .

SPARTAN

YOU CAN DRIVE IT BETTER WITH LEATHER*

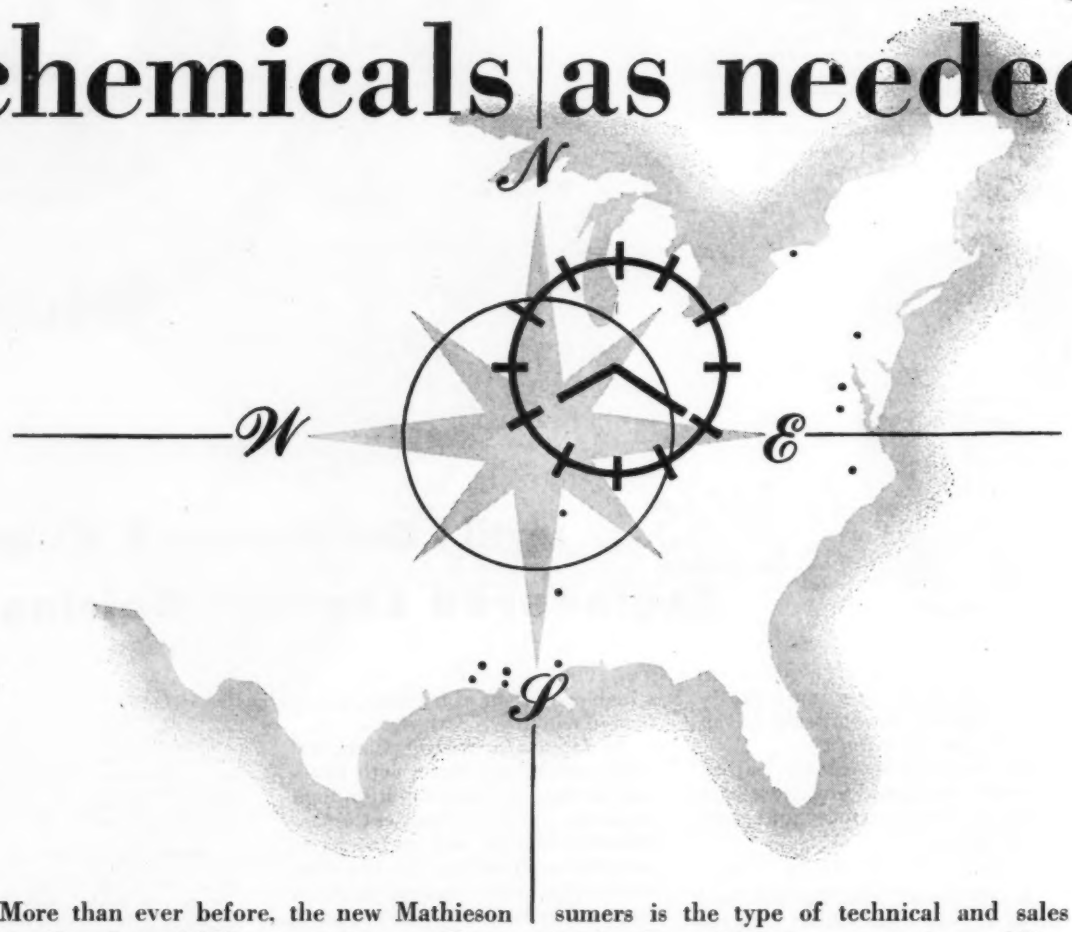
1851 100 YEARS 1951 OF SERVICE TO INDUSTRY

GRATON AND KNIGHT®

*Engineered LEATHER BELTING

DEPENDABILITY

-that delivers heavy chemicals as needed



More than ever before, the new Mathieson signifies dependability to customers. Physically, Mathieson's 14 great plants, strategically located to serve America's chief industrial areas, turn out a wider array of heavy chemicals than any other producer in the country.

In addition, many of Mathieson's basic products can be combined in various ways to meet shifting market conditions. Equally important to chemical consumers is the type of technical and sales leadership which is constantly enabling Mathieson to raise its standards of service.

As a result, the new Mathieson affords dependability based on capacity to produce, flexibility of production, diversity of products and processes, and high standards of service. Mathieson Chemical Corporation, Mathieson Building, Baltimore 3, Maryland.

Mathieson
CHEMICALS

12 Basic Heavy Chemicals • 14 Strategically Located Plants

SERVING INDUSTRY, AGRICULTURE AND PUBLIC HEALTH

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 32 • NUMBER 10 • JANUARY, 1951

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Weyerhaeuser installs two HORTON* stainless clad digesters

The Weyerhaeuser Timber Company recently expanded the pulp producing capacity of its Springfield, Oregon, mill from 150 to 250 tons per day. The two digesters that we fabricated and erected for this expansion are shown on this page.

The digesters were built of Type 316, 15 per cent, Columbium stainless-clad steel. The two vessels are designed in accordance with the 1950 ASME Code for a pressure of 110 lbs. per sq. in. at a maximum temperature of 650 degrees Fahrenheit. They were given a hydrostatic test at 187 lbs. per sq. in. and random x-rayed.

These stainless clad digesters are examples of the special equipment we build for the paper industry. We also fabricate flat-bottom tanks, elevated tanks, and many other steel plate structures. May we quote on your next job?

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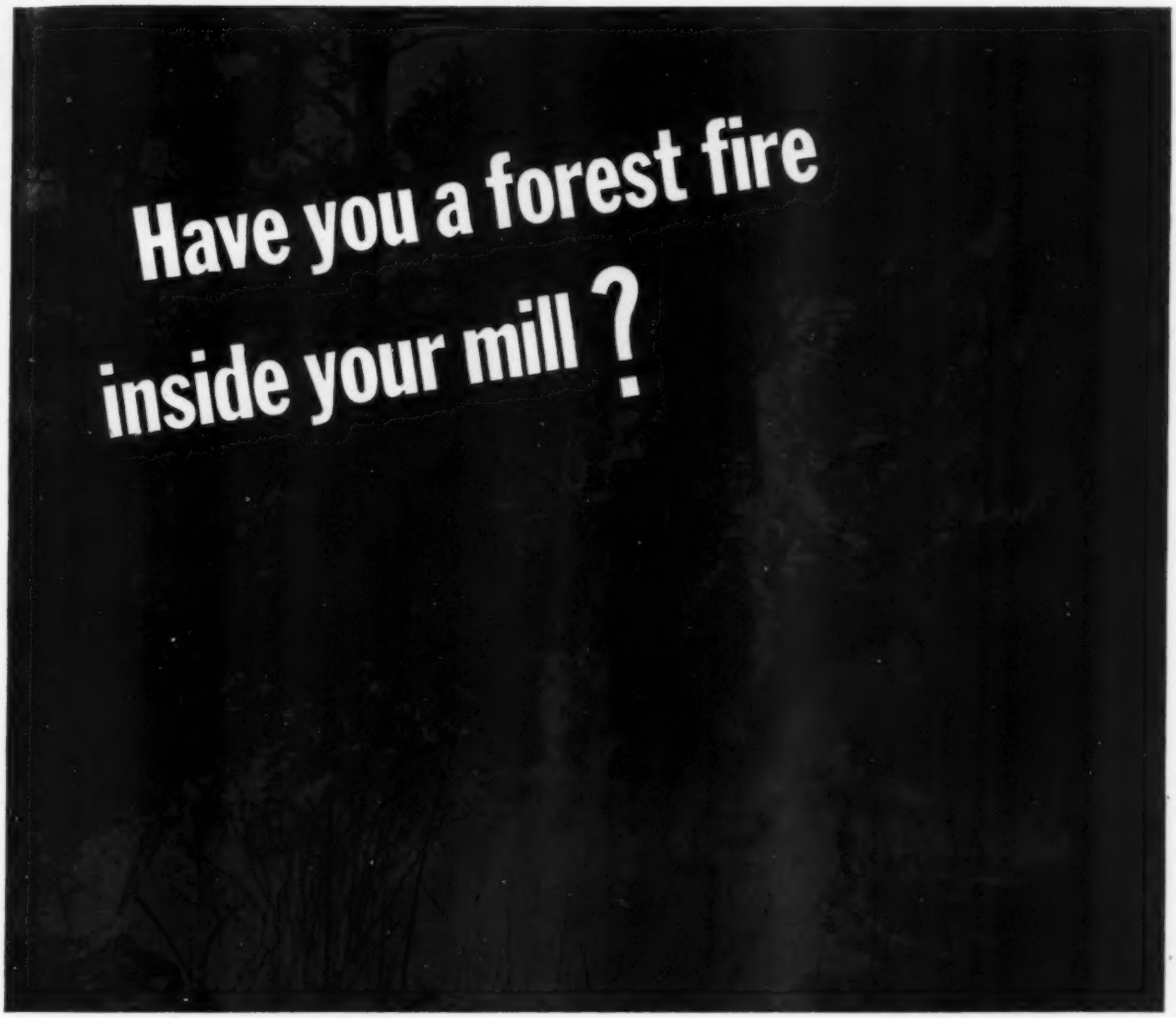
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.



Isn't a lot of your money going up the stack of your recovery furnace right now—money you spent for wood chips that won't become pulp? When you consider the cost of getting these chips into your wood bin, it might have been cheaper for you if the wood had been destroyed in a forest fire.

You can convert this loss into a profit very easily with the Sutherland High Yield System. It will give you a 20-percent increase in yield, plus substantial savings on steam and chemicals. Installed in your mill, this process will produce a clean, strong pulp of high freeness that is suitable for almost all tests and grades.

Our engineers will be glad to let you in on the "secret" of Sutherland High Yield. Just write us.

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continuous beating systems

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The PAISLEY PRODUCTS Division of Morningstar, Nicol, Inc. is prepared to give you quick, efficient service on all Morningstar products. *Consult your telephone red book.* PAISLEY maintains sales and service organizations in most principal cities.

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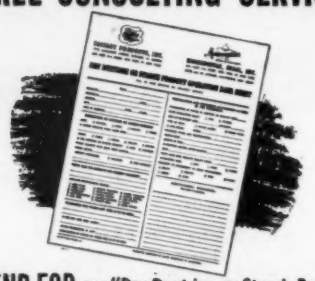

SEND FOR our "Dry Dextrine or Starch Product Operation Data Sheet." *Fill in and return it promptly. Our laboratory staff will gladly study your requirements and promptly recommend the one best and most economical formula to improve the specific operation you describe. This valuable laboratory service does not cost you one penny! Take advantage of it NOW!*

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Morningstar

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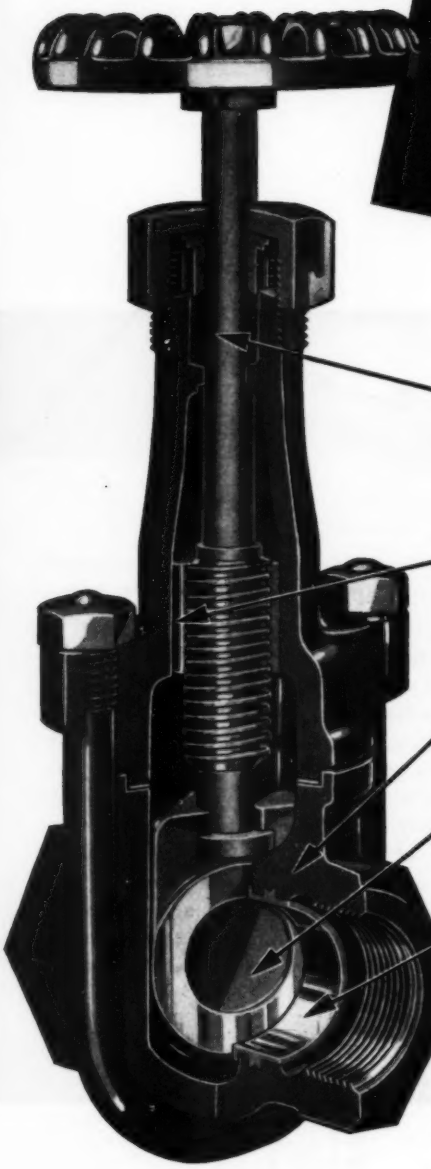
ONLY THESE CLIP GATES GIVE YOU THIS COMBINATION



★ **STEM LIFE INCREASED 20 TO 30 TIMES** Valve stems of the new OIC Alloy 40 offer greatest resistance to corrosion, wear and galling; no seizing.

★ This special, extra large duct permits complete drainage of the bonnet and prevents damage by freezing.

★ Thick, scientifically designed walls make OIC Valves strong and sturdy. No distortion.

★ Wide wedge prevents warping and allows plenty of space for accurate seating. OIC Clip Gates pass rigid air tests; no oil or wax on seating surfaces to hide leakers.

★ *Exclusive in OIC Clip Gates, 2" and under:* Seats are cast in place and then rolled to make *doubly sure* they are tight and secure. Greatly superior to simply rolling in against machined surfaces.

To be certain of the best, ask for OIC Clip Gates.
The Ohio Injector Company, Wadsworth, Ohio.

OIC
FOUNDED 1883

VALVES

FORGED AND CAST STEEL · IRON · BRONZE

600 TONS OF PAPER PER DAY AT 1500 FT.-A-MINUTE

Calls for faultless control of oil pressure to press rolls

● Extending 300 ft. in length, towering 17 ft. and weighing 3,350,000 lbs., this mammoth Dryer section, only one segment of a complete Rice Barton Corporation paper making machine, is constructed to produce 600 tons of paper per 24-hour day at about 1500 ft.-a-minute clip.

Such round-the-clock production, 7 days a week, leaves no room for "unscheduled" down-time, for an hour's hold-up represents at least 25 tons lost from the daily production rate . . . 25 tons never to be regained.

Vital to the continuous operation of this mill are the Hydraulic Control Panels . . . depended upon for the critical function of controlling the oil pressure ("holding-down" pressure) to the paper machine press rolls. Faulty operation, through excessive hydraulic oil temperature, could well mean tons upon tons of production losses.

Guarding the condition of the hydraulic oil to assure trouble-free operation of these control panels, and accordingly, helping to guard the service reputation of the entire Rice Barton paper machine, are compact Ross Type BCF Exchangers. As small as they are, as relatively minute in cost as they are to the value of the whole machine, they are relied upon for the giant responsibility of maintaining a constant supply of hydraulic oil at most effective temperatures. Otherwise, pump slippage, internal leakage and malfunction of precision-made controls could easily inflict production losses many times the cost of the Ross units.

Rice Barton plays it safe with . . .

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HYDRAULIC OIL COOLERS

IMPORTANT DATA AVAILABLE For further information on the vital function of Ross Exchangers in hydraulic and other applications, request literature.

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AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON

You Can't Have Good Paper

Without Good Chemicals . . .

ALUMINUM SULFATE

Standard: Lump; Ground, 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh.

Iron Free: Lump, approx. 2½", Ground thru 8 mesh. Liquid, 32° Be.

SODIUM SULFATE

(Salt Cake) . . . Paper Makers' Grade, thru 8 mesh, 95-99% Na_2SO_4.

Chemicals are vital in the manufacture of paper. You can't have good paper without them. That is why particular paper makers, when ordering alum, salt cake and other process chemicals, make sure of quality and *specify "General Chemical."*

Other General Chemical Products For the Paper Industry

- **Aqua Ammonia**
- **Chromium Potassium Sulfate** (Potash Chrome Alum)
- **Disodium Phosphate** (Anhydrous)
- **Glauber's Salt** (Crystal and Anhydrous)
- **Hydrochloric Acid** (Muriatic)
- **Nitric Acid**
- **Sodium Bisulfite** (Anhydrous)
- **Sodium Fluoride**
- **Sodium Hyposulfite**
- **Sodium Metasilicate**
- **Sodium Silicate**
- **Sodium Sulfide**
- **Sodium Sulfite** (Anhydrous)
- **Sodium Thiosulfate**
- **Sulfuric Acid**
- **Tetrasodium Pyrophosphate** (Anhydrous)
- **Trisodium Phosphate**

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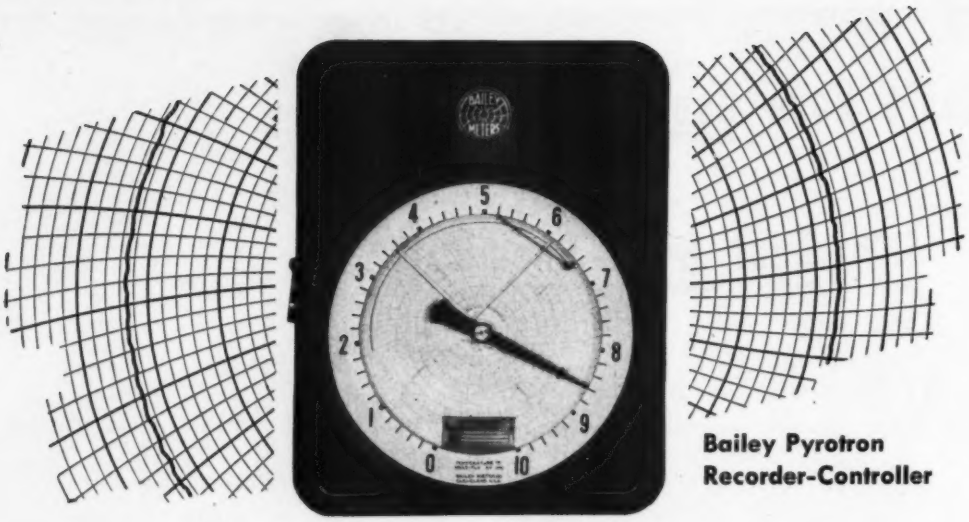

Bailey Pyrotron Recorder-Controller

Looking for Better Temperature Instruments?

. . . Then check these features of Pyrotron Electronic Resistance Thermometers . . .

FUNDAMENTAL ACCURACY

Bailey Pyrotron Resistance Elements are made of highest purity platinum—the material used by the National Bureau of Standards in establishing basic standards for temperatures from −190°C to +660°C.

THREE TYPES OF CONTROL

Pyrotron Controllers may operate: on-off electrical systems by either electronic relays or electric contacts, modulated electronic systems, or air-operated systems. Two temperatures may be recorded on the same chart and controlled by a single instrument.

FACTS PUT INTO USABLE FORM

Bailey Pyrotrons may be arranged to put temperature facts into convenient usable forms. If two or more temperatures are related, they may be recorded as continuous records on the same chart for easy comparison. The average of several temperatures or the difference between two temperatures may be recorded as a single continuous record which may be retransmitted to a distant point or used to actuate a control system.

EASY INSTALLATION

Bailey Pyrotrons do not require careful leveling or protection against vibration. Three ordinary copper wires are all that is needed to connect each temperature sensitive element with the recorder. Power may be taken from any 115 volt 60 cycle circuit.

MINIMUM MAINTENANCE

The absence of galvanometers, batteries and standardizing equipment, together with the use of interchangeable unit assemblies, reduces Pyrotron maintenance to the vanishing point.

ABUNDANT POWER

A separate motor drive for each temperature furnishes abundant power to operate a recording pen, a controller and an alarm switch.

For the full story on this unusual electronic resistance thermometer which is suitable for ranges between −300°F and 1200°F, ask for Bulletin No. 230-C. P-21

BAILEY METER COMPANY

1058 IVANHOE ROAD • • • CLEVELAND 10, OHIO

Controls for Processing

TEMPERATURE FLOW
PRESSURE LEVEL
% OXYGEN DENSITY
% COMBUSTION RATIO

VARIETY

is not the spice of life here but it

Permits Piping Improvement

Midwest offers a large variety of welding fittings to help *you* improve *your* piping. Many of these fittings were originated by Midwest for the purpose.

For example, the Midwest Reducing Elbow saves a third of the welding, decreases turbulence and pressure drop and improves appearance when used instead of a standard elbow and reducer. Midwest Long Tangent Elbows have a tangent or straight section at each end equal to ¼ the nominal pipe size; this saves pipe, saves time in lining up, and often saves welding. (These are in addition to ASA Type and Short Radius Elbows.) Midwest Sleeves relieve the line butt weld of all bending stress and much of the tensile stress. Midwest Saddles restore the original pipe strength and reinforce the joint.

Use of Midwest Welding Fittings assures maximum improvement and economy in piping. For your welding fitting needs, get in touch with the Midwest Distributor near you.

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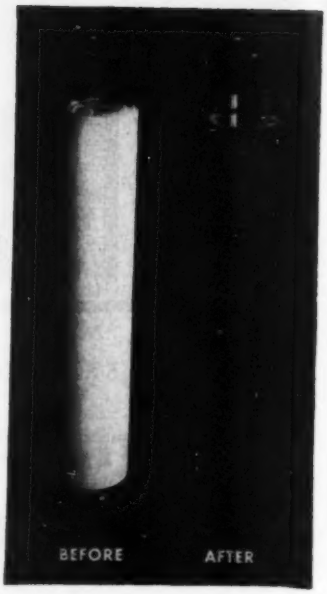
MIDWEST WELDING FITTINGS Improve Piping Designs and Reduce Costs

IF YOU HAVE A

stream pollution PROBLEM

LOOK AT THESE BEFORE-AND-AFTER PICTURES



SVEEN PEDERSEN

FLOTATION

SAVEALL

Clarifies water to such an extent that effluent contains less than two-tenths of a pound of filterable solids per 1,000 gallons.

OTHER ADVANTAGES:

Rapid return of recovered fibers.
Clarified water usable in many places.
High efficiency on free, slow, or filled stock furnishes.
Simplicity in cleaning due to open construction.
Low maintenance costs—no screens, few moving parts.
Relative insensitivity to fluctuation in quantity of incoming white water.

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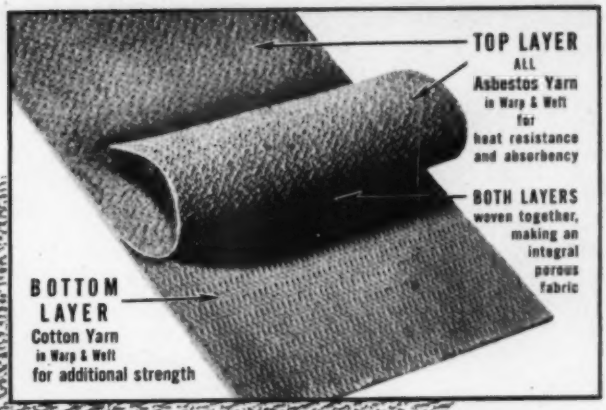
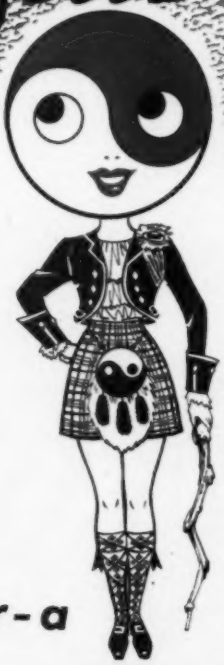
295 MADISON AVENUE, NEW YORK 17, N. Y.

In Canada: **ALEXANDER FLECK, LIMITED**
416 WELLINGTON STREET, OTTAWA, ONTARIO

ASTEN

dryer felts





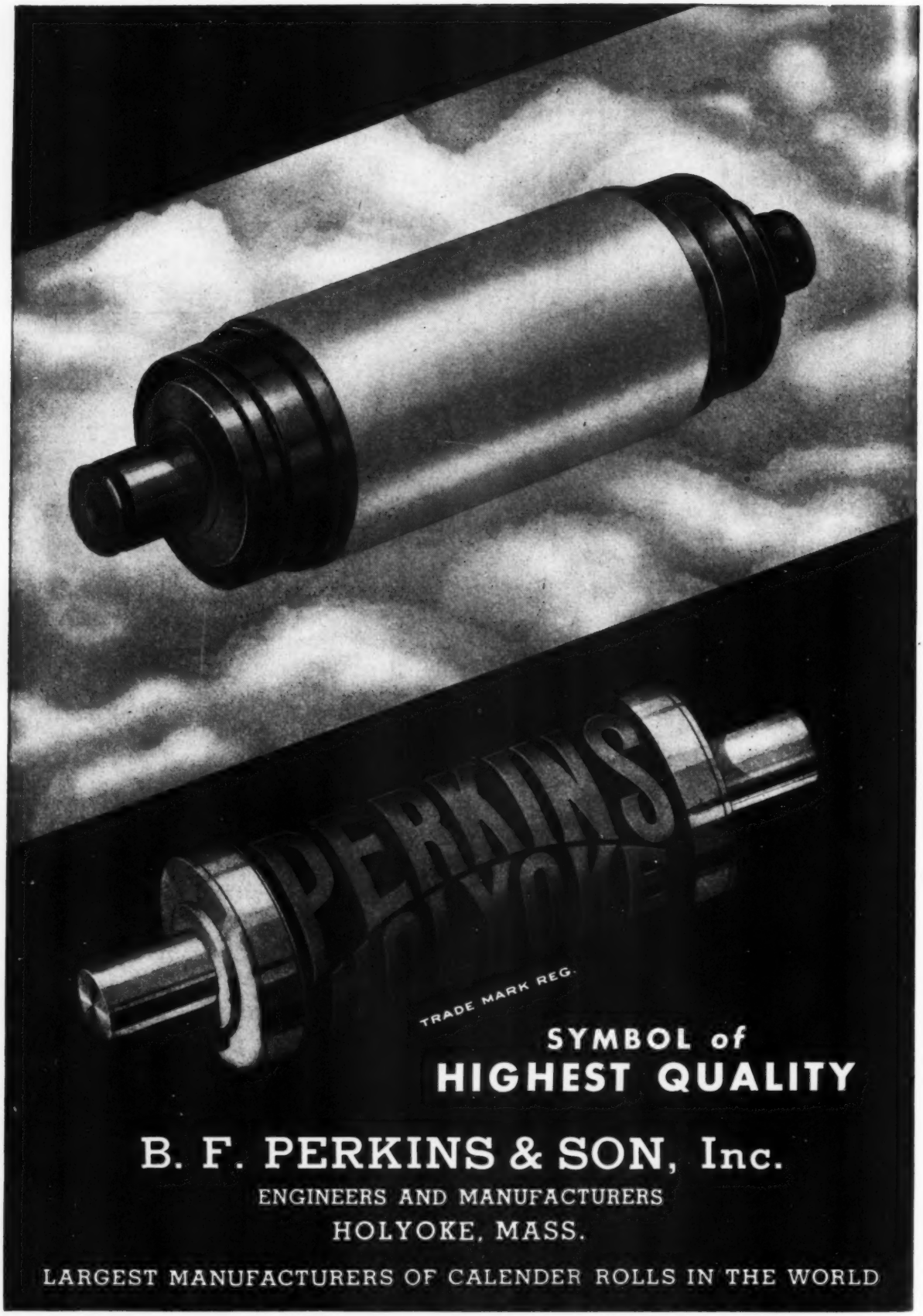
Vur-r-a

ECONOMICAL

The sheet side of ASTEN Dryer Felts has asbestos yarn in both directions, giving full protection from the hot dryers. As a result, they last longer and give a lower cost per ton. If you're a *canny* man that likes *mickle* profits, you'll use ASTENS in your mill.

ASTEN-HILL MFG. CO.
PHILADELPHIA, PENNA.

ASTEN-HILL, LTD.
VALLEYFIELD, QUEBEC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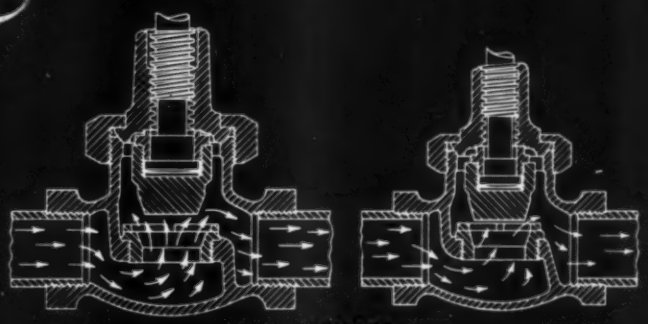
LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

POWELL gives you *Full Flow* in a Throttling Valve



COMPARE
the flow characteristics of the new Powell "W.S." Valve (left) and the ordinary globe valve (right). Note the extra large opening through the seat (nominal pipe size) and the greatly increased lift of disc, when wide open.

This is actually a dual service valve in that it can be throttled to any desired degree, yet, when wide open, permits FULL FLOW through the body. Thus turbulence and pressure drop are reduced to a minimum—a triumph in engineering that exemplifies Powell's continual leadership in the field of industrial valve design.

Powell "W. S."
Bronze Globe Valve
Fig. 2608

Write for folder giving full description of the many advanced engineering features of this valve.

POWELL

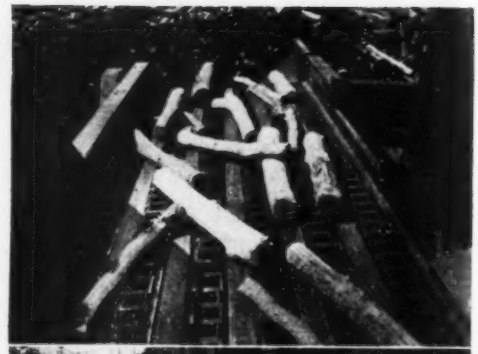
The WM. POWELL CO., 2525 Spring Grove Ave., P. O. Box 106, Station B, Cincinnati 22, Ohio

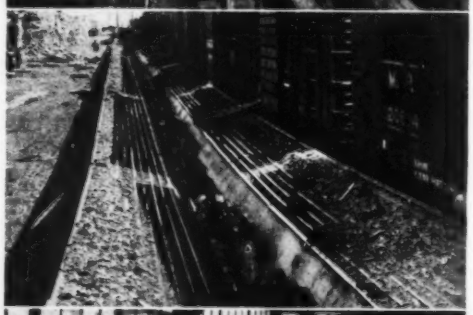
HANDLING *All the Way*
Pulpwood to Paper

The Pulp and Paper Industry is just one in which the diversified line of Jeffrey equipment meets practically all handling requirements. There is a proved unit to handle it economically and to your complete satisfaction . . . whether its pulpwood, rags, chips, lime, sulphur, straw, salt cake, paper rolls, packages of paper or board . . . as well as shredders and pulverizers for reducing material to a uniform product.

Belt Conveyors
Chip Conveyors
Chain Conveyors
Crushers (salt cake)
Elevators (bucket)
Feeders

Log Haul-ups
Re-chippers
Chains
Unloaders (barge)
Transmission Machinery





Photos show various applications of Jeffrey Material Handling Equipment handling chips and pulpwood. Whether from barges, yard storage or railroad cars Jeffrey Belt and Chain Conveyors take it away as fast as it comes.

Note the heavy type chain in the top installation view. This chain is built to take the severe punishment of falling pulpwood day after day. Chain was our earliest product. We know how to make it exceptionally well.

THE JEFFREY MANUFACTURING COMPANY

Established 1877

944 North Fourth St., Columbus 16, Ohio

Complete Line of Material Handling, Processing and Mining Equipment

JM

Baltimore 2 · Beckley, W. Va. · Birmingham 3 · Boston 16 · Buffalo 2 · Chicago 1 · Cincinnati 2 · Cleveland 15 · Denver 2 · Detroit 13 · Harlan, Ky. · Houston 2 · Jacksonville 2 · Milwaukee 2 · New York 7 · Philadelphia 3 · Pittsburgh 22 · St. Louis 1 · Salt Lake City 1 · Scranton 3

Jeffrey Mfg. Co., Ltd., Montreal, Canada
Jeffrey-Galion (Pty.) Ltd., Johannesburg, S.A.
The Ohio Malleable Iron Co., Columbus, Ohio
British Jeffrey-Diamond, Ltd., Wakefield, England
The Galion Iron Works & Mfg. Co., Galion, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio

Speed PRODUCTION Reduce OPERATING COSTS

More and more leading paper mills are using Yarway Motor-Operated Digester Valves on the blow lines from pulp digesters to blow tanks.

Economy and speed of operation are two main reasons.

The famous Yarway *Seatless* principle assures a *tight* valve—effectively sealing off the digester, preventing loss of black liquor, increasing number of cooks per day. The simple push button motor control at top of digester means speed.

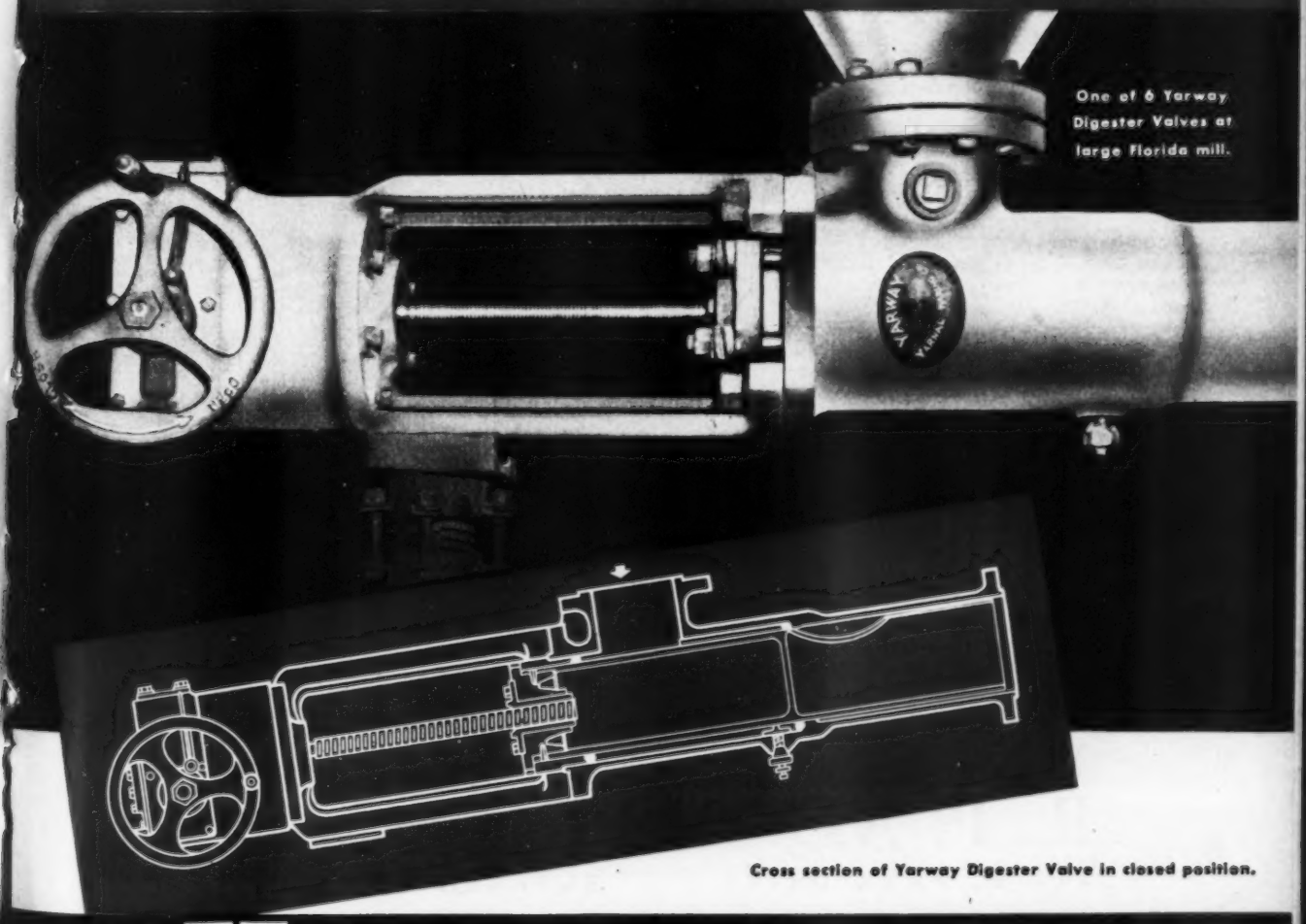
Metallurgical advancements also permit Yarway Digester Valves to withstand the pressure, shock and chemical action always encountered in this service.

In one mill, Yarways increased production 1½ to 2 cooks per day while reducing operating supervision. Another reports maintenance is lower than on any other type of valve for this service.

WRITE FOR NEW CATALOG NO. 440

YARNALL-WARING COMPANY
149 Mermaid Avenue, Philadelphia 18, Pa.

WITH YARWAY *SEATLESS* DIGESTER VALVES



One of 6 Yarway Digester Valves at large Florida mill.

Cross section of Yarway Digester Valve in closed position.

YARWAY BLOW-OFF VALVES

AT PORT ALBERNI, B.C.

Productive Log Barking

is "teamed up" with ADAMS *Automatic* WATER FILTERS

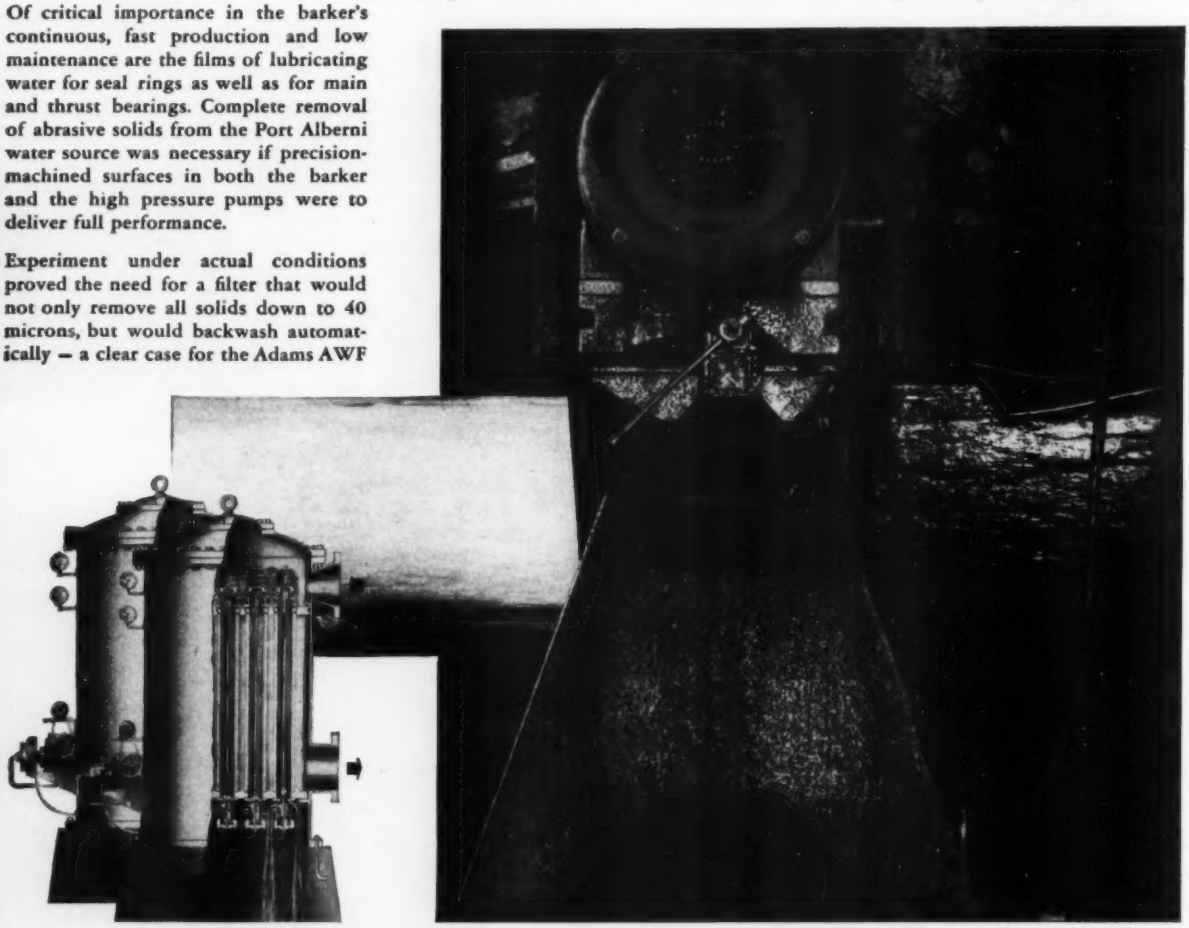
To convert raw water into a tool that blasts bark from logs of any shape or size, *Bloedel, Stewart & Welch* installed a matched team of Adams Automatic Water Filters ahead of their new Hansel hydraulic barkers.

Of critical importance in the barker's continuous, fast production and low maintenance are the films of lubricating water for seal rings as well as for main and thrust bearings. Complete removal of abrasive solids from the Port Alberni water source was necessary if precision-machined surfaces in both the barker and the high pressure pumps were to deliver full performance.

Experiment under actual conditions proved the need for a filter that would not only remove all solids down to 40 microns, but would backwash automatically — a clear case for the Adams AWF Filter with exclusive Adams Poro-Stone Filter tubes. ". . . Adams filters were installed and are performing admirably", states B. S. & W. resident manager.

If you would convert water — your cheapest raw material — into an efficient production tool for pulp, paper, and saw mills, it will pay you to investigate the R. P. Adams line of water filters now.

Send today for new 20-page, file size Bulletin No. 691 on Water Filtration in the Pulp and Paper Industry.

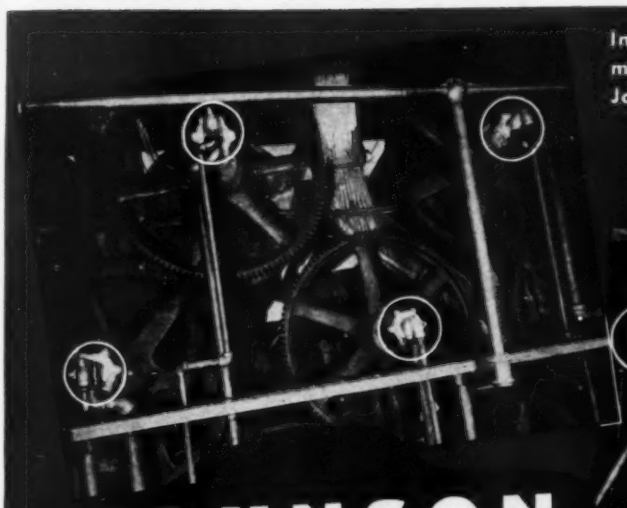


ADAMS AWF WATER FILTERS

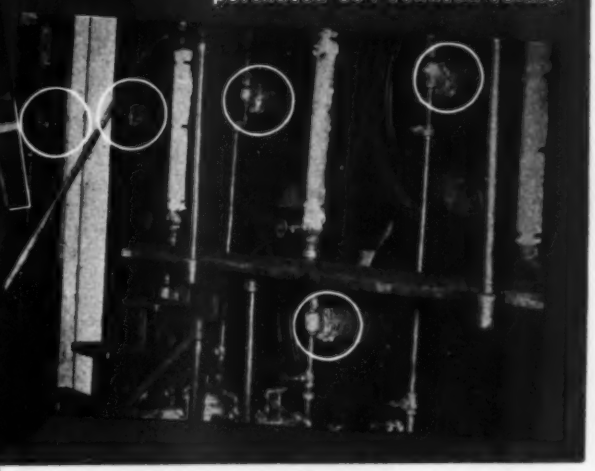
HANSEL 60" RING BARKER

R. P. ADAMS CO., INC.

213 E. PARK DRIVE BUFFALO 17, N. Y.



Installation in a mid-western mill — some of the 562 Johnson Joints purchased by this company.



Johnson Joints in service in a New England mill. This company has purchased 634 Johnson Joints.

JOHNSON
Rotary Pressure JOINTS

Knock the "stuffing" out of trouble . . . Put Production "on the double"

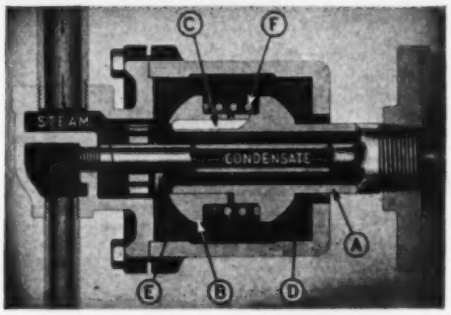
Take the verdict of the paper industry as a whole, and you'll get a pretty good idea of the merit of Johnson Joints.

You'll find them serving in hundreds of mills, all over the world. Leading machinery manufacturers have adopted them as standard equipment. Over two hundred mills have completely equipped one machine, and in many cases several machines, with Johnson Joints. An equal number are well under way on similar programs.

The reasons are two-fold. First of all the Johnson Joint literally knocks the stuffing out of stuffing box troubles. It is completely packless, self-lubricating, self-adjusting and even self-aligning. If it did nothing more the Johnson Joint would soon pay its own way. In addition it speeds production by ending many causes of machinery shutdown and by facilitating more efficient methods of syphon drainage.

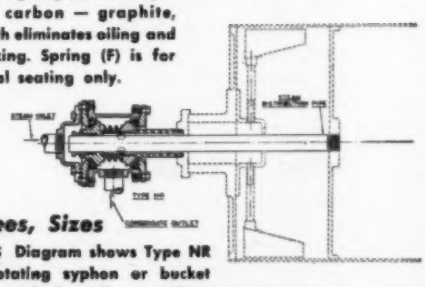
Johnson Rotary Pressure Joints are available now for all installation requirements. Standard Type B is shown in cross section at right. Type NR, one of many other arrangements is diagrammed below.

Get all the details . . . write for fact-filled literature!



Here's How It Works . . . . . .

Nipple (A) is connected to roll or drum. Sliding collar (B) is keyed to nipple at (C), but slides loosely over it so pressure can fill entire housing. This pressure becomes the sealing force, by pressing seal ring (D) tightly against nipple. Both seal ring and bearing ring (E) are of special carbon — graphite, which eliminates oiling and packing. Spring (F) is for initial seating only.



Types, Sizes for all Needs

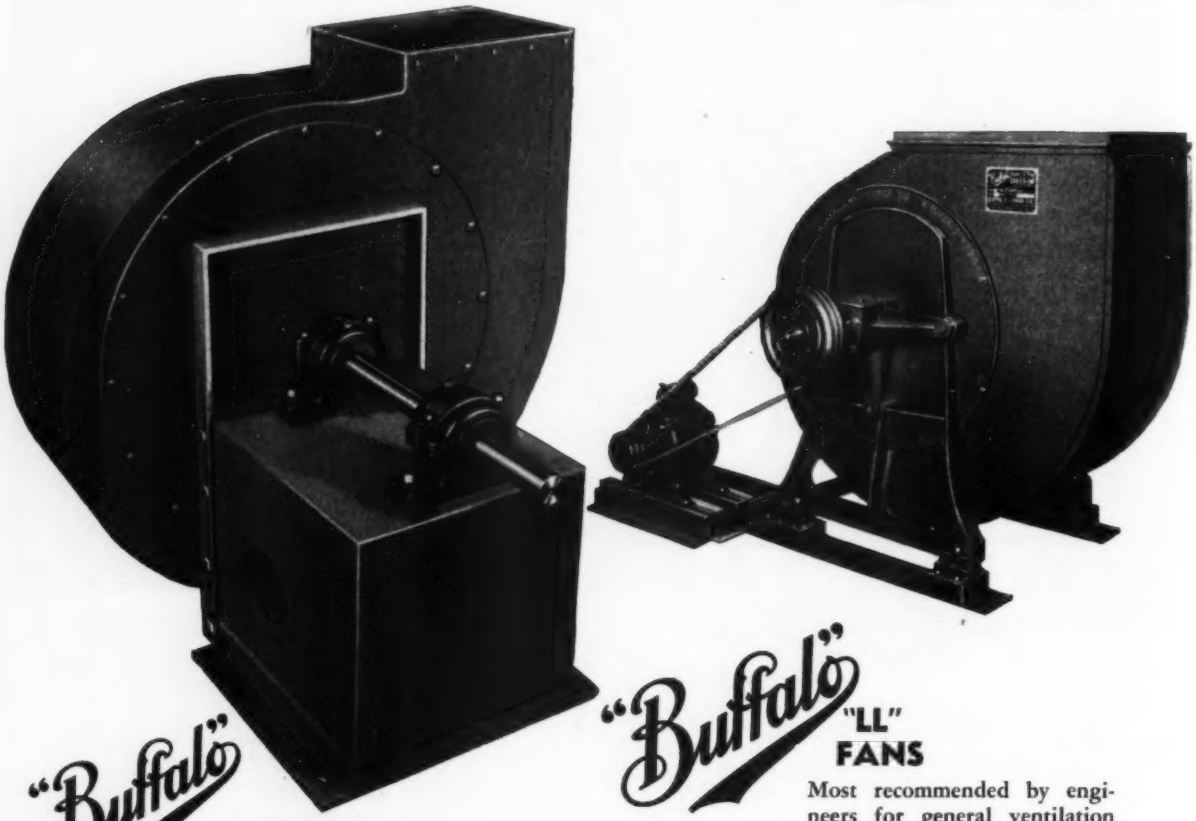
Diagram shows Type NR Johnson Joint, used with rotating syphon or bucket drainage where pipe rotates with the roll, as well as rotating steam supply pipe.

Product of The Johnson Corporation

845 WOOD STREET, THREE RIVERS, MICHIGAN

ROTARY PRESSURE JOINTS • COMPRESSED AIR SEPARATORS AND AFTERCOOLERS
DIRECT OPERATED SOLENOID VALVES • "INSTANT" STEAM WATER HEATERS

"WORK" Fans That Don't Ask High Wages!



"Buffalo" INDUSTRIAL EXHAUSTERS

These husky all-welded steel plate fans will do 3-shift work for you without babying—whether it's exhausting airborne dust, moisture and fumes —or conveying any materials a pneumatic system will hold. Choice of interchangeable material or air wheels, all with blades shaped properly for efficient work, not "paddle wheel" type. And smooth *rivet-free* interior surfaces add to the efficiency of these fans. One of the most useful—and long-lived—fans for your air removal jobs!

YOUR COPY! WRITE TODAY!

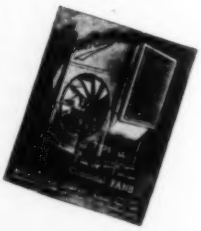
Bulletin 3576 has useful information on many types of exhausting, construction and performance data on "Buffalo" Industrial Exhausters. Worth having!

"Buffalo" "LL" FANS

Most recommended by engineers for general ventilation purposes, and supplying air to air conditioning apparatus in large installations, these fans offer many advantages. They are quiet, medium-speed, high-efficiency fans with backward double-curved blades and specially shaped inlet vanes—ideally suited in every way for the best air service. Sizes from 600 to 500,000 cfm. All good for decades of service with minimum attention.

YOUR COPY! WRITE TODAY!

Bulletin 3675 has all construction and performance data on "LL" Fans, including tables, specifications, friction chart, arrangements, etc. . . . a valuable booklet to have. WRITE TODAY!



"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

213 MORTIMER ST. BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Branch offices in all Principal Cities

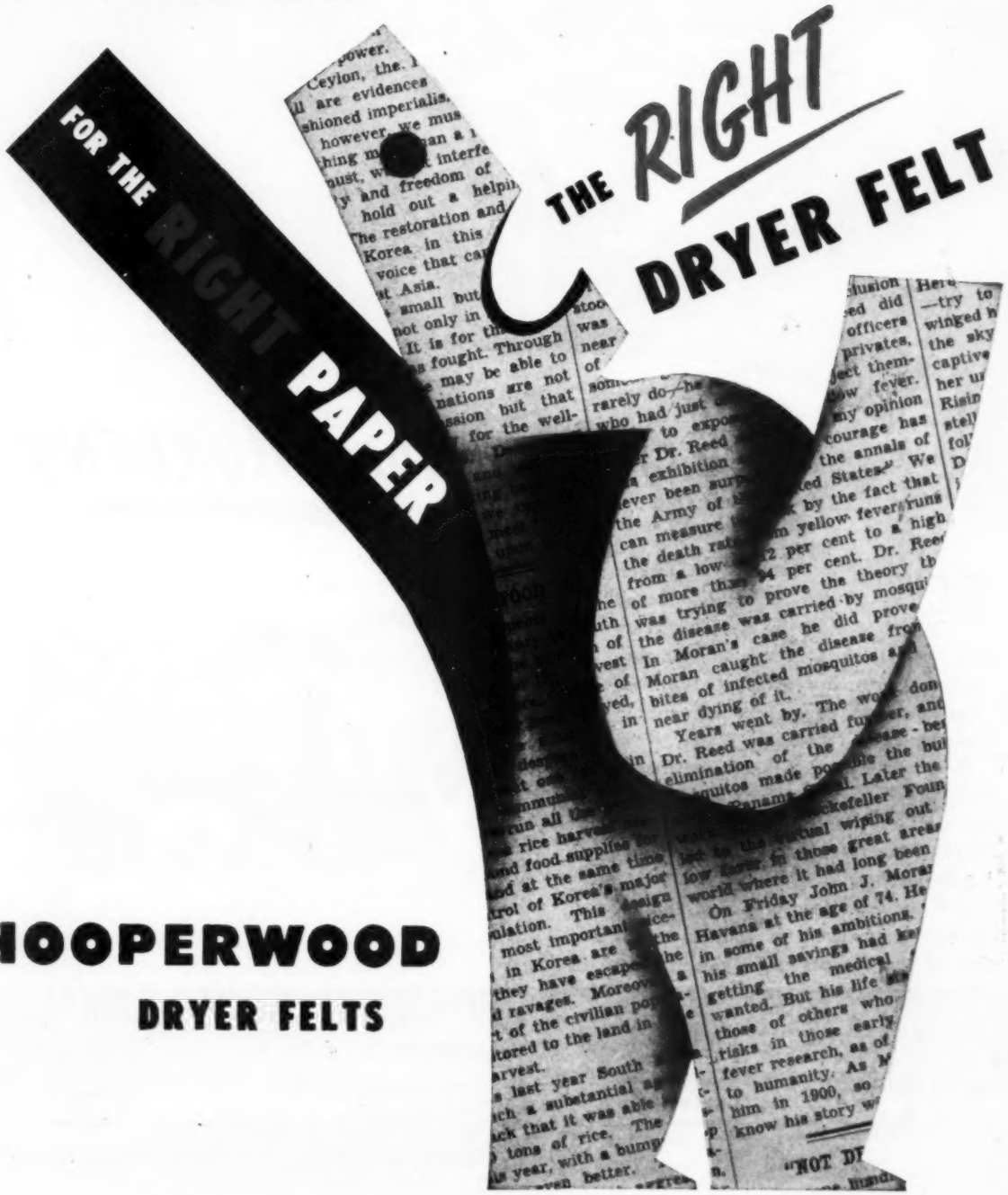
VENTILATING FORCED DRAFT | AIR WASHING COOLING | AIR TEMPERING HEATING | INDUCED DRAFT PRESSURE BLOWING | EXHAUSTING

Hooperwood Dryer Felts—
Cotton or Asbestos—are engineered
for the job they have to do.

Whether the product is kraft, writing,
newsprint, linerboard, book, or a specialty,
there's a Hooperwood Dryer Felt
made just for that job.

Write William E. Hooper & Sons Company
Juniper and Cherry Streets, Philadelphia 7, Pa.

MILLS: WOODBERRY, BALTIMORE, MD.

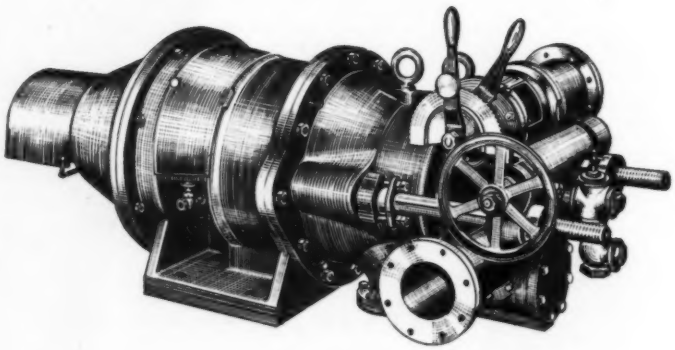


"we're ordering *More* MORDENS"

50% or better of the Morden "Stock-Makers" ordered during the last four years have been on repeat orders from old customers. Customers who have proved "Stock-Makers" superior performance in comparison with other equipment.

Nearly 500 "Stock-Makers" have been installed throughout the world during the last 15 years. Over 400 of these "Stock-Makers" have been installed during the last 4 years.

Such universal acceptance of "Stock-Maker" argues well for your investigation of the benefits to be gained from "Stock-Maker's" beating and refining.



PLAN TO ATTEND

MORDEN MACHINES COMPANY

PACIFIC BUILDING, PORTLAND 4, OREGON

In Europe: Millspaugh, Limited . . . . . Sheffield, England
In South America: Parsons & Whittemore, Inc. . . New York City
In Canada: The William Kennedy & Sons, Ltd., Owen Sound, Ontario

Nalco

PITCH CONTROL Produces These Typical Results:

✓ "PAPER MACHINES IN FINE CONDITION"

From a Nalco Engineer's report on The Nalco System of Pitch Control in a mill producing fine papers:

"Beater Room Superintendent reported that paper machines were in very fine condition when examined during shutdown period over the weekend. Trays were reported in very good condition and much better than formerly noted. No sticking on press rolls. Oliver filter reported in good condition, no plugging. The Savalla Saveall reported in very good condition."

✓ NALCO ELIMINATED PITCH AND POPLAR WAX

In a mill manufacturing semi-chemical pulp, another Nalco Engineer reports:

"This company ran into considerable trouble recently from pitch and poplar wax in their semi-chemical corrugated medium. These waxes caused filling of wires and sticking of press rolls which in turn caused up to 30 breaks in a day. Nalco Pitch Control was applied at the fan pump and eliminated their trouble."

THE examples above are typical of the success and versatility of The Nalco System of Pitch Control in paper and pulp mills. Pitch-free operation saves time and money in these mills, and helps to produce a better product.

If you have pitch control problems, write Nalco for full data on the efficient, economical Nalco System as it may apply to your mill.

NATIONAL ALUMINATE CORPORATION
6232 W. 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario, Canada

THE SYSTEM • Serving the Paper Industry through Practical Applied Science

APPLETON *Felts*

—FOR DESIGN AND FINISH

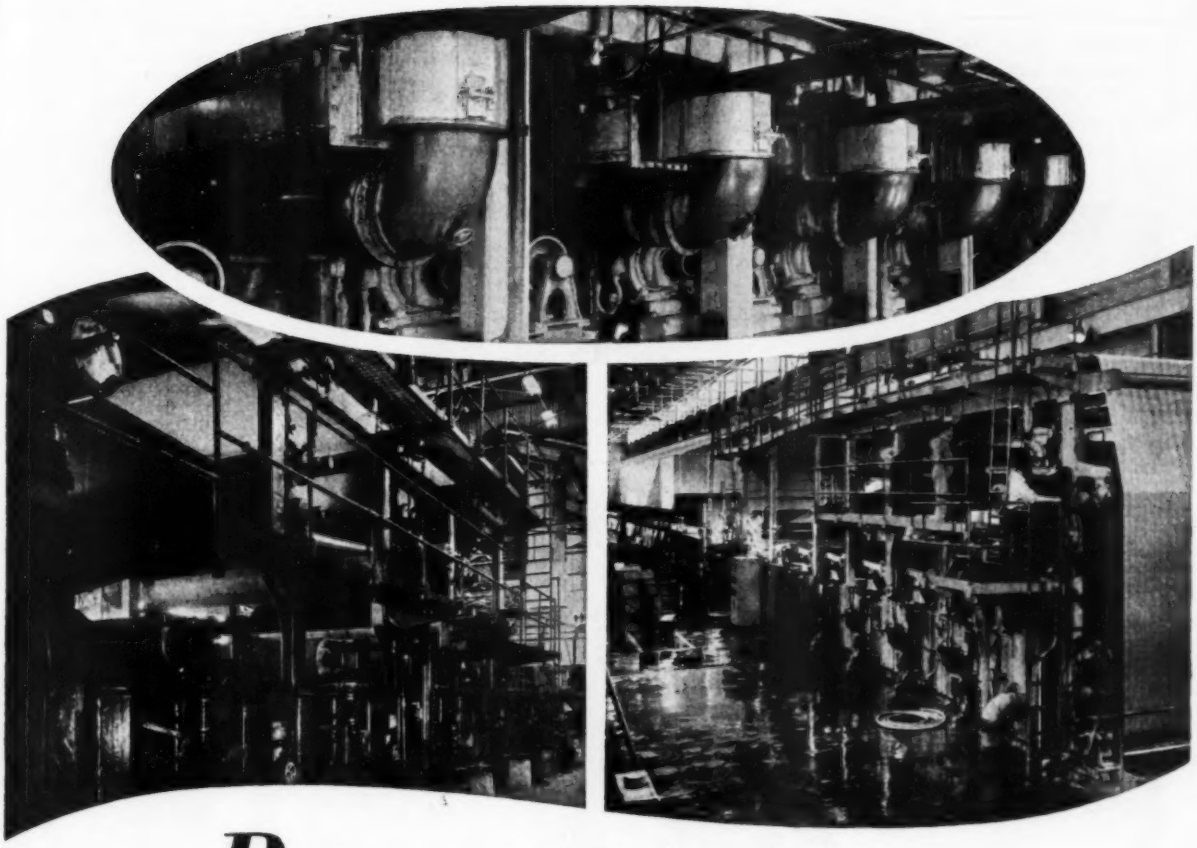
—FOR SERVICE

—FOR UNIFORMITY

—FOR DEPENDABILITY

make
APPLETON FELTS
good
paper

APPLETON WOOLEN MILLS
APPLETON · WISCONSIN



Recent B-C machines feature overhead presses

Two of several recent Black-Clawson machines featuring presses superimposed on vat section —one with B-C Hydronamic Inlets on liner vats only, the other with Inlets on all vats.

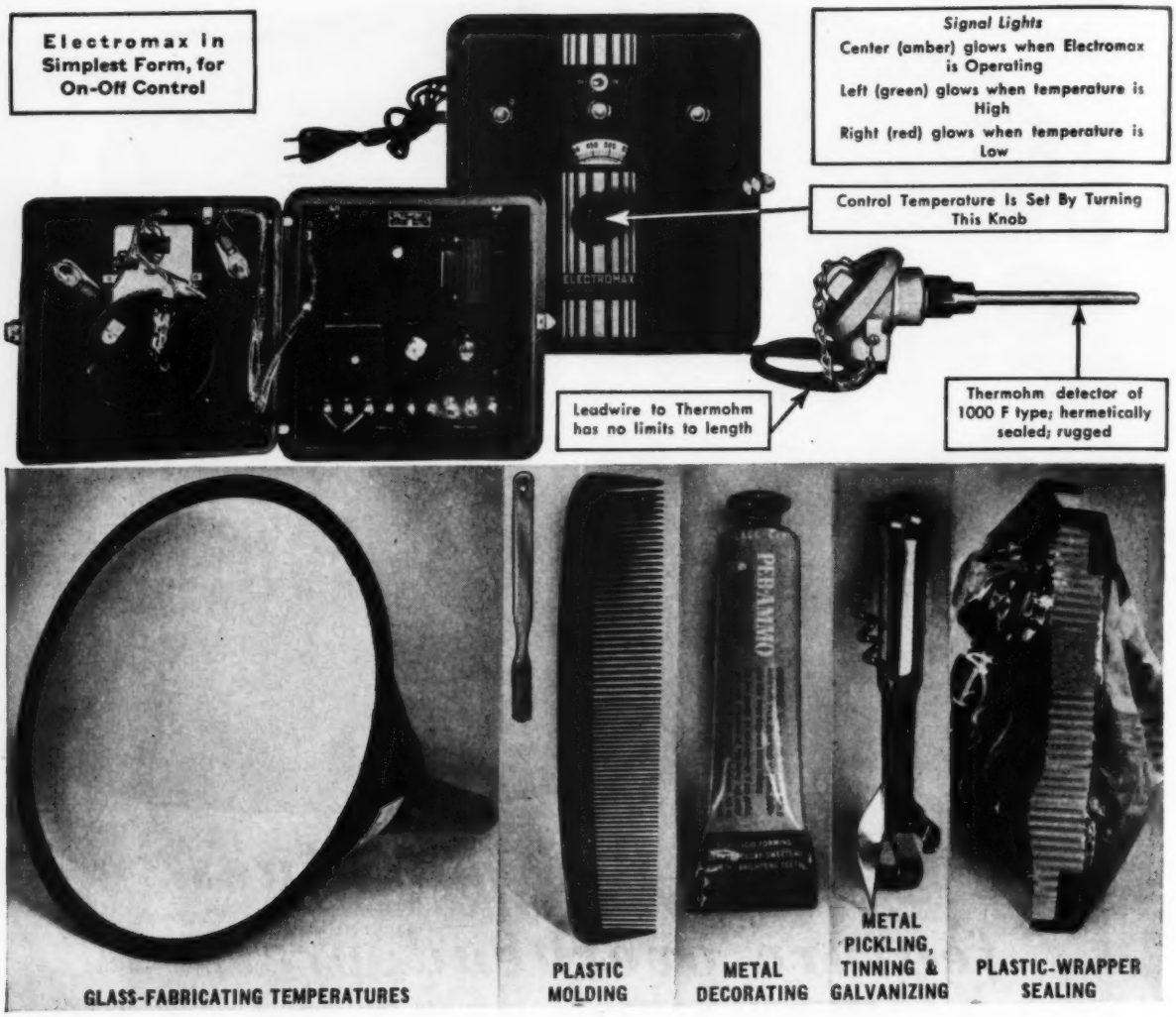
Black-Clawson, incidentally, holds the distinction of having been the first designer to: 1. build a cylinder machine wider than 100"; 2. develop the vertical dryer; 3. develop a more efficient way to deliver the stock to the mold by bringing out the B-C Hydronamic Inlet; 4. bring their engineering and shop practice to a truly high standard of precision and make possible substantially higher cylinder machine speeds.

If you are thinking of a new machine, Cylinder or Fourdrinier, Black-Clawson would appreciate an opportunity to consult with you and submit estimates.

BLACK-CLAWSON

HAMILTON, OHIO

Divisions: SHARTLE BROS. MACHINE CO., Middletown, Ohio
DILTS MACHINE WORKS, Fulton, New York
Western Sales Office: Mayer Bldg., Portland, Oregon
Southern Sales Office: 937 Coventry Road, Decatur, Ga.
Associate: ALEXANDER FLECK LIMITED, Ottawa, Canada
Subsidiary: B-C INTERNATIONAL, LTD., Greener House
66/68 Haymarket, London, S. W. 1, England


Electromax in Simplest Form, for On-Off Control
Signal Lights
Center (amber) glows when Electromax is Operating
Left (green) glows when temperature is High
Right (red) glows when temperature is Low
Control Temperature Is Set By Turning This Knob
Leadwire to Thermohm has no limits to length
Thermohm detector of 1000 F type; hermetically sealed; rugged
GLASS-FABRICATING TEMPERATURES
PLASTIC MOLDING
METAL DECORATING
METAL PICKLING, TINNING & GALVANIZING
PLASTIC-WRAPPER SEALING

PROTECT PRODUCTION WITH ELECTROMAX CONTROL

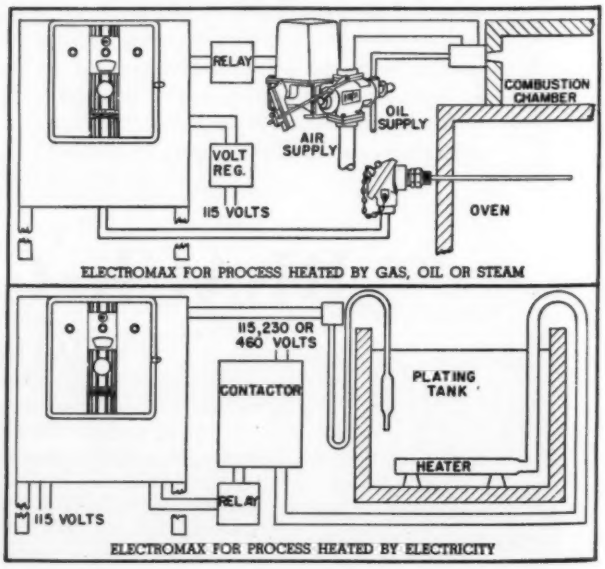
ELECTROMAX CONTROLLERS give modern *electronic* regulation to thousands of important manufacturing processes. They exactly fill the bill for non-recording controllers of outstanding dependability.

Electromax has the sensitivity, accuracy and dependability of its big brother Speedomax Recording Controller. Likewise, it is not affected by vibration or building tremors—can even be mounted on the frame of a molding press. The instrument needs almost no attention, because it has only one moving part —a covered, plug-in type relay. There's usually no need to open its door for months at a time.

You can specify any one of 3 types of control action:

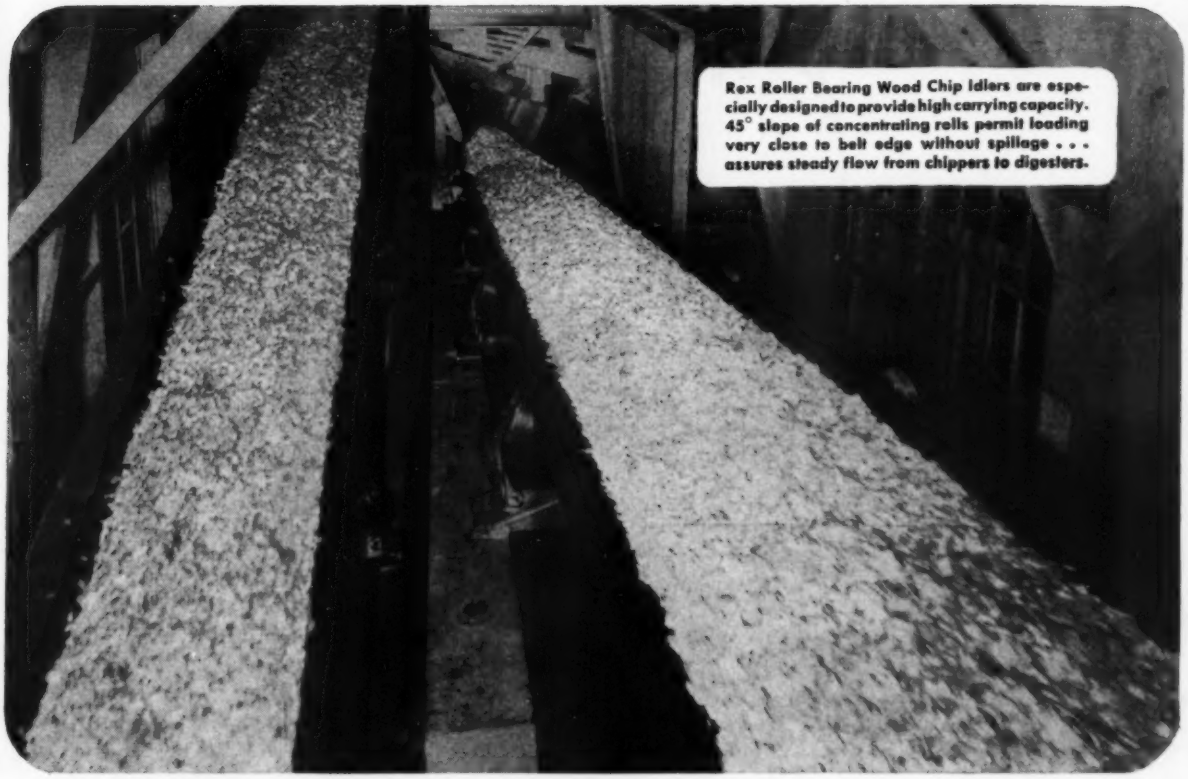
1. On-Off or 2-position Control
2. Proportioning, automatic reset and rate (D.A.T.) Control
3. Proportioning and manual reset (P.A.T.) Control

For further information, write our nearest office, or 4974 Stenton Ave., Philadelphia 44, Pa.



MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES
LEEDS & NORTHRUP CO.

Jrl. Ad ND47(1)



Rex Roller Bearing Wood Chip Idlers are especially designed to provide high carrying capacity. 45° slope of concentrating rolls permit loading very close to belt edge without spillage . . . assures steady flow from chippers to digesters.

Rex Idlers make money for you!

Whether you're handling wood chips or refuse, Rex Belt Conveyor Idlers make money for you. How?

First, the basic design of these long-lasting idlers practically eliminates power consumption, and the well-balanced roll units are exceptionally easy on the belt.

Second, the Rex triple labyrinth grease seal keeps grease in . . . dust out, and assures almost indefinite life to the extra capacity tapered roller bearings.

Third, each idler roll is a sturdy unit in itself, removable and completely interchangeable.

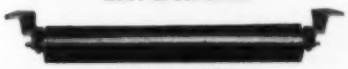
Fourth, the rugged, durable construction of the rolls means maximum roll life, and economical idler service.

These cost-cutting Rex features mean important savings to you in longer life for both idlers and belts, lowest maintenance and repair costs, simplified inventory, plus dependable unfailing idler service.

Rex Belt Conveyor Idlers

Rex Troughing Wood Chip Idlers.

Rex Flat Belt Idlers



Rex Return Idlers

Many other types of Rex Idlers are also available as well as a complete line of pulp mill chains, pulpwood and refuse conveyors, white water recovery equipment, process and waste screening equipment.

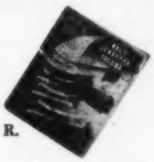
For the complete story on these money-making idlers, mail the coupon at the right.

CHAIN BELT REX COMPANY

Belt Conveyor Idlers

CHAIN BELT COMPANY
of Milwaukee

50-203A



CHAIN BELT COMPANY
1714 West Bruce Street
Milwaukee 4, Wis.

Gentlemen:

( ) Please send Bulletin No. 463 R.

Name.....

Company.....*Dept.*.....

Address.....

City.....*State*.....

Here is how modern paper mill operators are making vital savings with

BECKMAN pH CONTROL

THE BECKMAN MODEL H-2 pH METER is one of a complete range of Beckman pH Meters available for every type of application*. The H-2 is particularly recommended for applications where high accuracy and simple operation—combined with the convenience and low cost of 115-v. AC operation—are desired.

It provides instant and direct pH readings, and a simple, built-in dial permits quick, convenient temperature compensation over the entire range of 0° to 100°C (32° to 212° F.). High reading accuracy is assured by wide-spread dual range scale that reads from 0 to 8 pH or from 6 to 14 pH at the turn of a switch. Same switch also provides instant millivolt readings from 0 to ±800 mv and from ±600 to ±1400 mv for titrations and oxidation-reduction measurements.

Built-in electrode support and compact case design save valuable space and permit easy portability to various plant locations.

Particularly important is the wide range of factory-sealed, maintenance-free Beckman Glass Electrodes available for use with this instrument . . . electrodes that are virtually unbreakable . . . that cover extreme temperature ranges from below freezing to above boiling . . . that have an unprecedented pH range with negligible errors . . . that are abrasion-resistant and chemically durable to a degree never before thought possible in glass electrodes.

*In addition to the H-2 Meter, other Beckman pH equipment includes completely automatic pH indication and control instruments for large-scale process applications . . . battery-operated models for complete portability in plant and field use . . . and a laboratory type instrument that features maximum versatility and accuracy for research and laboratory applications

Throughout the pulp and paper mill industry, profit-minded operators are stepping up plant efficiency, reducing waste and cutting costly maintenance by Beckman-controlling the pH of an increasing variety of paper mill operations. For example . . .

- *In both hard and soft water areas Beckman pH control is used to insure more uniform pre-conditioning of the plant water and substantial savings in chemicals.*
- *Many kraft mills insure a cleaner pulp by checking the efficiency of the washers with Beckman pH Control. Because Beckman electrodes are exceptionally rugged and abrasion-resistant, they can be placed directly in the flow of stock to the knotters.*
- *By controlling the pH of the furnish or white water, proper freeness is assured at lowest chemical cost with greater uniformity of operation and minimum corrosion of costly wire.*
- *In the making of sized sheet and paper board, the set of the size is also critically dependent upon accurate pH control. A better product results—at lower chemical costs.*
- *Where the sheet is colored, close pH control is even more important, because the uniformity of color and permanency in the finished product—as well as the set, freeness and wire corrosion—are all dependent upon the accuracy of pH control during processing.*
- *Printing qualities of the finished paper—its ability to take ink, its whiteness, its strength and its color stability—are also closely dependent upon accurate pH control.*
- *These and many other important paper mill applications are outlined in a helpful pulp and paper mill bulletin available on request. Write for your free copy today!*

WHY BECKMAN pH CONTROL? Leading paper plants prefer Beckman pH control because only Beckman provides the rugged, abrasion-resisting, high pH type of glass electrodes necessary for sustained accuracy and long life in modern paper mill operations. And, as outlined at left, Beckman provides the industry's most complete selection of pH equipment.

Let your nearest Beckman instrument dealer point out the many important advantages found exclusively in Beckman pH equipment. Or write direct.

BECKMAN INSTRUMENTS
control modern industries

Beckman Instruments, Inc.
South Pasadena 73, Calif.
Factory Service Branches:
NEW YORK • CHICAGO • LOS ANGELES

Beckman Instruments: pH Meters and Electrodes — Spectrophotometers — Radioactivity Meters — Special Instruments

The Paper Industry

January 1951

Paper Industry Well Equipped for War Economy

IN A SWEEPING CONSERVATION MOVE, the National Production Authority closed the old year with a directive intended to tighten the national economy. On December 28, an order was issued against accumulating "in excess of reasonable demands," more than 50 classes of raw materials and manufactured items. Following that order, the Government took control of virtually all rubber supplies. Also, to reduce bank credit, the Federal Reserve Board moved to curtail bank loans to private borrowers. A day later, the use of copper in some 300 items was sharply restricted.

The order against accumulating excess stocks carries a $10,000 cash fine and a year in prison. It broadens the NPA ruling of September 18 directing that inventories of certain defense materials be held to the minimum working level.

Among the materials covered by the order are:

Wood pulp—insulation material made of pulp, and gypsum board.

Paper products—converted paper and board products, paper, paperboard, and construction paper and board materials. Officials said newsprint and other printing papers are covered by this ban.

The order also covers iron and steel, a long list of other metals, minerals and chemicals.

This, the first real impact of the present international situation to affect the paper industry, specifically, came just six months after the United States actively entered the war in Korea.

Prior to World War II, paper was taken pretty much for granted, and when at the beginning of that war the government bodies began to mobilize and restrict all industries and their production, it was a year and a half before the term "essentiality" was applied to pulp and 28 types of paper and board (P.I. and P.W., June, 1943).

Its recognition as an essential war commodity will make the production and distribution of pulp, paper, and paperboard subject to the controls, limitations, and allocations required to divert production from consumer goods to military supplies. More important, however, is that an "essential" rating will help the industry obtain necessary operating and maintenance supplies which, in many instances, are stringently controlled. Already the allocation of copper, rubber, nickel, etc., is having an effect on the availability of equipment.

One gratifying fact is that the pulp and paper industry, on the whole, is in better shape to weather the storms of a war economy than it was ten years ago. Then, many paper manufacturers were just coming out of the depression. Plans for modernization and expansion were nipped in the bud by world events, and, for the most part, were held over until the war ended.

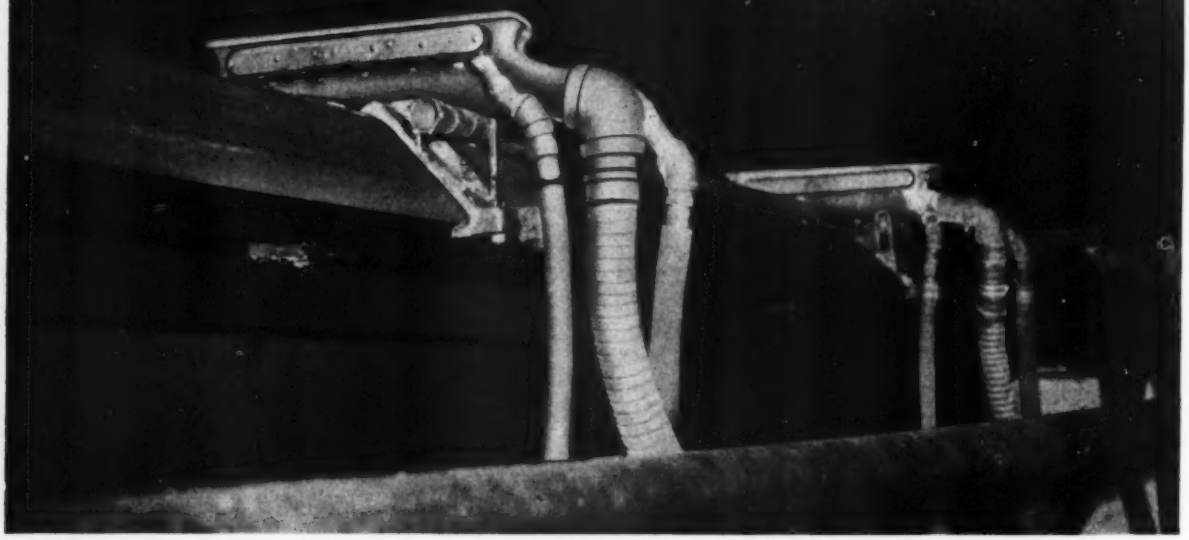
Postwar expansion is a matter of record. Now after five years, the paper industry is in better shape than at any time in its history. Many new mills have been built. Many old mills have added capacity by installing new equipment or by modernizing and rebuilding old machinery. Armed with operating experience gained during the last war, we should be able to profit by many of the lessons learned then.

While the operation of industry under a controlled war economy always presents problems, we should be able to handle most of them satisfactorily, even though they may inflict a burdensome tax on our ingenuity—and our profits.

Today's Hard Working, Fast Running Press Felts

DEMAND

VICKERY FELT CONDITIONERS



Has felt conditioning kept pace with felt operation in *your* mill?

Modern Vickery Felt Conditioners equipped with "Jordan" type vacuum boxes and high speed gear boxes keep the felts continuously clean and absorbent however fast they run. The heavy production losses caused by midweek shutdowns to wash clogged felts are eliminated once and for all.

Now, you need Vickery Felt Conditioners more than ever. Make sure your Conditioners are equipped to meet today's conditions.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

The Paper Industry Current Comment

New Year Spotlight on Nation's Economy

President gives leading industrialist full authority in defense mobilization . . . Paper industry must play same part as in World War II, but with a first nighter audience

OF MAJOR IMPORTANCE in the national emergency scene is the appointment by President Truman of Charles E. Wilson, General Electric Co. president, as head of a new super defense agency, the *Office of Defense Management.*

In this position, Mr. Wilson will be—second only to the President—the highest authority in the Nation over all governmental activities pertaining to the defense effort. He will have supervision over all productive controls and allied responsibilities.

As czar of industry, Mr. Wilson faces the almost impossible task of converting the horde of megalomanic politicos in Washington agencies into one efficient co-ordinated and working machine. There are already so many alphabetical agencies at Washington that the English language hardly provides enough letters to cover them, and if the present maze of interlocking groups is expanded, it would take an alphabet the size of the Chinese to provide the needed number of characters.

It is not too extreme to quote a man conversant with industry problems now and in the official World War II days as saying that the present functioning of existing agencies, with the crop of new groups, is complicating operations into a contradictory mess which exceeds anything known in the days of the last war. A public example is the case of the issuance of the protested order to General Motors to roll back the prices of new cars. Asking for a review of the order, the company was told that the agency which issued the order does not yet have a sufficient staff to analyze the factors entering into a proper pricing of the machines. Yet reports at Washington are that the new civilian setups will require the employment of some 250,000 additional civilian employees.

Controls move closer

There seems little doubt that there will soon be price control over much of the nation's economy. It was expected that the November elections would cause a deferment of the establishment of such controls, but the involvement of China in the Oriental war forced a hurry-up of the nebulous program which had been tentatively projected.

Political considerations have not ceased to influence Washington actions—and this applies alike to the Administration and the opposition. The Administration wanted to rush through legislation in the lame duck session which would be doubtful of passage in the incoming Congress. The opposition sought deferment of even some needed legislation to permit the shaping of future laws to be measured by the reaction of the public as shown in November.

While all of this discussion may seem far afield as regards paper, this is not the case. Paper finally was recognized in World War II as a most vital defense commodity. Every step taken by any Washington agency has its repercussions on the paper industry. Orders regarding copper affect the production of fourdrinier wires. Orders on chlorine react on the usage of this bleach in the making of paper.

Technicalities confuse some of our economies

An example of the inter-agency conflicts which are developing is that of the ECA action to ship sulphur and woodpulp to Europe, though both are in short supply for domestic mills. The Forest Service will only allow the use of Alaskan pulpwood if it is converted into pulp in mills located in the Territory.

And speaking of conflict, another pulpwood example is found in the case of trees leveled by the recent storms in the Adirondack region of New York. Some 2,000,000 cords of wood are on the ground but cannot be removed, even for fire prevention purposes under the state laws for the conservation of the Adirondack forest area. This enormous resource is given to bugs and fire rather than to relieve a national shortage—and at a time when future pulp prices are likely to feel the force of extremely heavy demand.

P.I. must re-enact its wartime requirements

The paper industry already is experiencing difficulties in persuading appropriate agencies to profit by the experience of World War II in the formulation of a workable program to get for the Government the paper it requires. After nearly two months the efforts to clarify the situation began to clear up, and only after two months, although a thoroughly satisfactory procedure was in effect in the World War II period. However, as always at Washington, new blood has to impose new ideas, and whether a modification of the old procedure known as M-241 will prove more efficient remains to be seen.

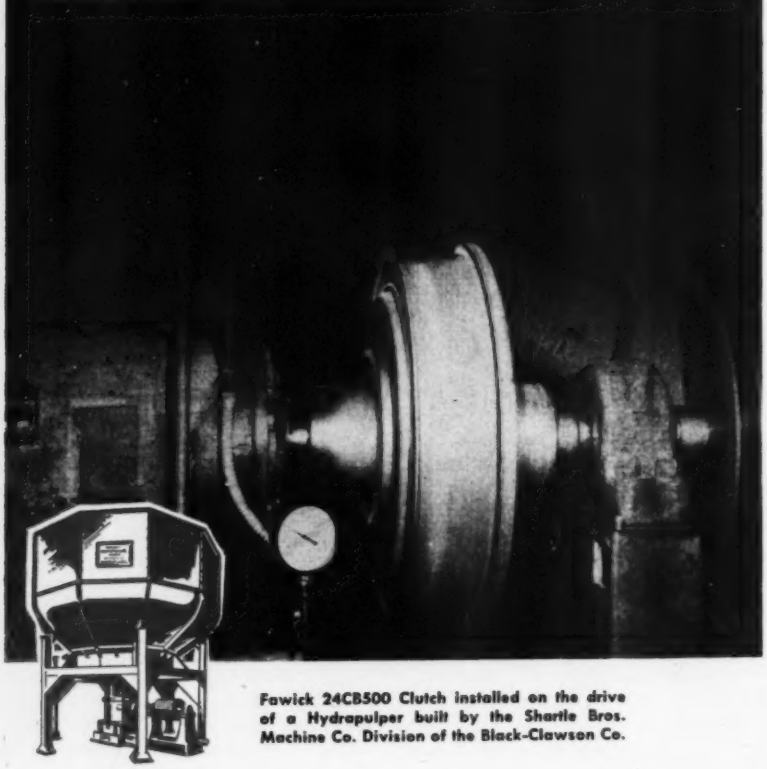
Paper production holds notwithstanding extra wartime demands

In the face of the kaleidoscopic condition at Washington, paper mills are filling orders at a rate of production breaking all previous records. Paper boards are in great demand for use in connection with the shipment of military supplies, and the demand is just beginning. Civilian users are feeling the shortage through their inability to secure the tonnage needed for normal consumption. The wastepaper market is exceedingly bullish as a result of the demand for container material.

All in all the prospects for 1951 can be foretold as approximating the most stringent days of World War II. Paper men are to be called to Washington in a dollar-per-year capacity, or as regular employes, men with a real knowledge of the industry. The hope of the paper industry for reasonable allocation of Gov-

FAWICK CLUTCH AT WORK

REMOVING LOAD SHOCKS FROM A PULPER



Fawick 24CB500 Clutch installed on the drive of a Hydrapulper built by the Shartle Bros. Machine Co. Division of the Black-Clawson Co.

Fawick Clutches installed in Hydrapulper units serve a two-fold purpose. The flexible side walls of the actuating gland transfer powerful operating torque to the beaters, at the same time cushioning load shocks during operation. This shock-absorption greatly reduces maintenance requirements on equipment and provides long, top-efficiency clutch service.

In addition to these vital characteristics, the 360° constant-velocity contact with the friction surface insures full power efficiency at all times. Quick response, positive clutch action, and elimination of lubrication and mechanical linkages are additional advantages for pulp beater operation.

Fawick Clutches installed in the drives of your paper mill machines will provide insurance against downtime caused by premature wear of machine parts.

FAWICK AIRFLEX CO., INC.
9919 CLINTON ROAD, CLEVELAND 11, OHIO

For specific information on all advantages of Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland, Ohio, for Bulletin 300.

FAWICK Airflex

ernmental orders in a proper ratio to civilian requirements will be largely determined by these men from the industry, actually loaned to the Government. That high class industry talent is being placed in key positions is the safest guarantee to the industry against a blind program of procurement for the nation's war needs.

Technically, this may not be a time of war, but so far as the paper industry is concerned, it is already entering a stringent wartime economy.

Business Press Editors Pledge Co-operation

Early response to the appointment of Mr. Wilson came from the Business Press when Julien Elfenbein, past president, and L. C. Morrow, president-elect for 1951, of the National Conference of Business Paper Editors, sent wires expressing complete co-operation to Charles E. Wilson and to Commander Cisen, office of Public Information Department of Defense. The Conference of Editors is affiliated with the Associated Business Publications, Inc.

These wire communications named the following committee of editors who have been appointed to co-operate with Office of Defense Mobilization:

James G. Lyne, chief editor, *Railway Age*

Godfrey Lebhar, chief editor, *Chain Store Age*

Dr. Sidney D. Kirkpatrick, editorial director, *Chemical Engineering*

Eldridge Peterson, chief editor, *Printers' Ink*

Phillip W. Swain, chief editor, *Power* and *Operating Engineer*

Julien Elfenbein, editorial director, *Home Furnishing Publications*

L. C. Morrow, consulting editor, *Factory Management and Maintenance*

C. O. Willson, chief editor, *Oil and Gas Journal*

Evan Just, chief editor, *Engineering and Mining Journal*

Richard W. Porter, editorial director, THE PAPER INDUSTRY

T. C. Dumond, chief editor, *Materials and Methods*

Burham Finney, chief editor, *American Machinist*

Richard S. Aitchison, chief editor, *Industrial Marketing*

Walter F. Crowder, chief editor, *Industrial Distribution*

Frank Lawler, chief editor, *Food Industries*

Financial

December securities market reached a twenty-year high, and paper mill issues as a rule shared in the advances. Some of the values as shown in December, 1950, are far above, often double, those of a year ago.

Crown Zellerbach Corp.—Net income for six months ended October 31 was $12,411,785 as compared with $8,656,013 for the same months of 1949.

Hinde and Dauch Paper Co.—Income for

New Camachines®

of all types, installed in the first six months of 1950, added more than 105,000 feet per minute (web speed) to industry's potential roll production capacity.

Constantly expanding *Camachine* volume reflects the increasing need for top-quality roll products in the paper, printing, plastics, textile and rubber industries.

Wherever materials are produced or converted in roll form, *Camachines* may be depended upon to provide trouble-free slitting and winding at record-breaking roll production speeds. There's a reason for *Camachine's* unquestioned leadership... for 57 years Camachine engineers have specialized in the design and manufacture of faster, more dependable roll production equipment. *Camachines* raise the standards for roll quality, increase the pace of roll production, reduce the cost of the roll product.

Camachine 20

World's fastest paper mill winder, produces top-quality rolls at speeds up to 5000 f.p.m. on newsprint. Features air-operated slitters. Widths from 180" to 300". Rewound diameters to 40" on paper, 60" on board. Write for the descriptive bulletin "Mile-a-Minute."

105,000 feet per minute!*

*This figure is a composite of the web speeds of *Camachines* both *large and small* installed during the first half of 1950.

Cameron Machine Company • 61 Poplar Street • Brooklyn 2, N. Y.

Camachine engineers will be pleased to consult with you on any roll production problem.

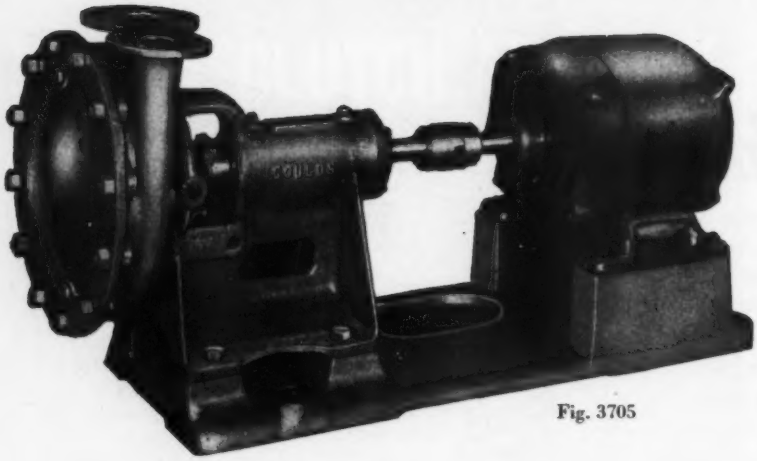


Fig. 3705

For Outstanding Service Handling Corrosive Liquids—

Goulds new stainless steel centrifugals

ADVANCED PUMP DESIGN—

The Goulds 3705 stainless line represents the last word in effective design. Fig. 3705 pumps will give you efficient, dependable, 24-hour service in handling corrosive liquids—*at* low cost.

CAPACITIES—

Goulds stainless steel centrifugals are made in 8 sizes with capacities to 750 G.P.M. and heads to 180 ft. depending upon capacity.

ADVANTAGES—

Exceptional efficiency (see Bulletin for performance curves) plus extreme simplicity make this an ideal pump for corrosive applications. High interchangeability of parts cuts stocking problem. Quick inspection or cleaning—simply remove casing cover without disturbing pipe connections.

MEMBER

Write for Bulletin 725.3 for complete details on this new stainless steel pump.

Goulds PUMPS INC.
Seneca Falls
New York

nine months ended October 31 was $2,029,035 as compared with $1,842,816 a year ago.

Hollingsworth & Whitney Co.—Net income for 39 weeks ended October 31 was $1,030,094 as compared with $1,000,187 a year ago.

P. H. Glatfelter Co.—Net income for nine months of 1950 was $823,678 as compared with $433,752 a year ago.

Kimberly-Clark Corp.—Net income for twelve months ended October 31 was $12,223,171 as compared with $6,226,470 for the previous fiscal year.

Masonite Corp.—Net income for three months ended November 30 was $1,359,191 as compared with $6,226,470 for the previous fiscal year.

Marathon Corp.—Net income for the year ended October 31 was $6,536,036 as compared with $4,519,217 for the previous fiscal year.

Minnesota and Ontario Paper Co.—Net income for nine months ended September 30 was $3,607,717 as compared with $2,449,366 a year ago.

St. Regis Paper Co.—Net income for nine months ended September 30 was $7,003,924 as compared with $6,226,470 for the previous fiscal year.

United Board & Carton Co.—Net income for 24 weeks ended November 11 was $306,621 as compared with $73,045 for the comparable period a year ago.

New York Stock Exchange—Stocks

	Closing Prices Dec. 20, 1950	Nov. 18, 1950	Dec. 31, 1949
A.P.W. Products	7	6	4
Celotex	14⅜	15	20⅛
Same Preferred	15½	16⅜	18
Certain-teed Products	14	14⅛	12⅛
Champion P.&F. Co.	47	44⅜	22⅜
Same Preferred	106	106⅛	91½
Chesapeake Corp.	28⅜	----	26⅞
Continental Diamond	12⅛	11¼	8⅞
Container Corp.	† 31⅜	60⅛	33⅞
Same Preferred	103⅝	*102½–104⅜	95½
Crown Zellerbach	45⅞	45	25
Same Preferred	103⅜	103⅜	96
Dixie Vortex	44⅜	44½	27
Same "A"	* 52–53	52	50
Eastern Corp.	19½	18⅞	13½
Robert Gair	12¼	10⅞	6⅜
Same Preferred	* 18–18½	18⅜	17¼
Gaylord Container	23⅞	23¼	21⅜
International Paper	50½	48⅛	‡ 51⅜
Same Preferred	*107–110	105½	93½
Kimberly-Clark	46	43⅞	20⅜
McAndrews & Forbes	40	40	35½
Marathon	34¼	34	20⅜
Masonite	60	60½	57
Mead Corp.	22⅜	23⅜	‡ 16¼
Same Preferred	93½	92⅜	82
Same 2nd Preferred	54⅜	58	32
National Container	11	10¼	9⅜
Paraffine Cos.	----	17	19
Same Preferred	----	98	103½
Rayonier, Inc.	42	43½	28
Same Preferred	* 35¼–35½	34⅜	32
Scott Paper	44	44½	‡ 47⅜
Same $3.40 Pref.	* 98–99	90	93
Same $4.00 Pref.	*106–107	106	----
St. Regis	11⅜	10¼	8¼
Same Preferred	* 93–95	94½	80⅜
Sutherland Paper	* 43–44	45	52⅜
Same Preferred	*113–114½	115	----
Union Bag & Paper	37⅜	38	30⅝
United Board & Ctn.	17	15	6½
United Wall Paper	2⅜	2⅜	2⅞
Same Preferred	* 22½–23½	* 22½–23	22½
U. S. Gypsum	99½	115	101⅜
Same Preferred	184	183½	171
West Va. P.&P. Co.	73½	65½	40
Same Preferred	*109–109⅞	111	106

New York Stock Exchange—Bonds

	Closing Prices Dec. 20, 1950	Nov. 18, 1950	Dec. 31, 1949
A.P.W. Products 3%	----	----	----
Celotex 3½%	102	----	101⅜
Champion P.&F. Co.	104	----	99⅝
Mead Corp. 3%	107	----	102½

New York Curb Exchange—Stocks

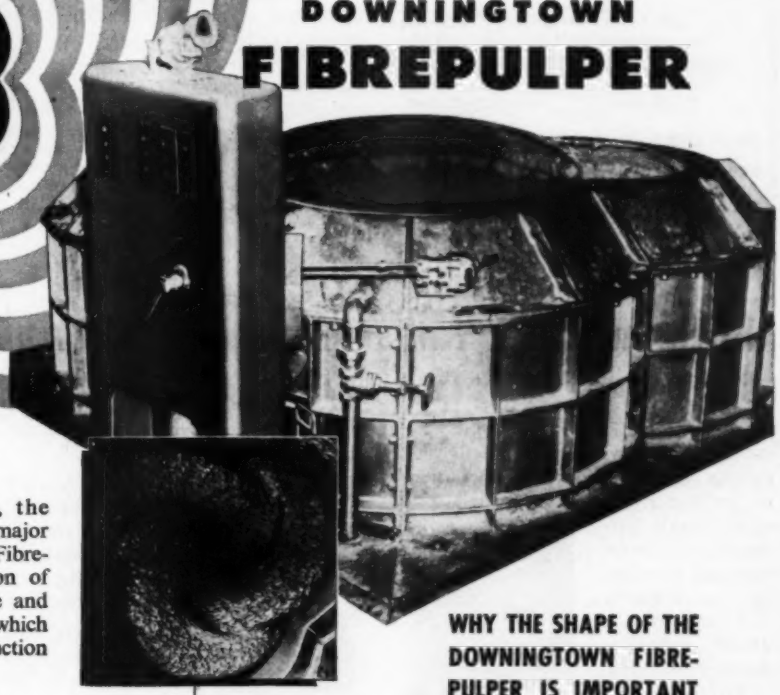
	Closing Prices Dec. 20, 1950	Nov. 18, 1950	Dec. 31, 1949
Am. Writing	3½	3	5⅜
Great Northern	44½	45¼	39¼

* Closing Bid and Asked Prices.
† New.
‡ Old.

WHAT SHAPE CAN DO

DOWNINGTOWN FIBREPULPER

produces MORE with LESS power



Because of its unique design, the Downingtown Fibrepulper marks a major advance in stock preparation. The Fibrepulper requires less power per ton of product than any similar machine and provides these additional features which bring substantial savings in production costs:

1. Shorter pulping period with less hydration and higher freeness.
2. Faster time cycle, providing greater pulping capacity per machine.
3. Compact design takes less floor space.
4. Custom designed and built to meet your particular operating conditions and production requirements.
5. Smaller capital outlay with lower charges to overhead.

Write NOW for complete specifications and description of the Downingtown Fibrepulper giving tons-per-hour capacity needed.

WHY THE SHAPE OF THE DOWNINGTOWN FIBREPULPER IS IMPORTANT

The Fibrepulper is designed with four lobes, each of which develops its own stream of stock feeding the pulp back to the impeller in an interweaving, overlapping pattern. Stock circulating around the periphery is forced back to the impeller and is mixed uniformly with stock from other parts of the Fibrepulper (see illustration). The large impeller increases pulping rate *without* a proportional increase in power.

MORE EFFICIENT USE OF POWER — Much of the power, used only for circulating in a round tub, is utilized for pulping in the four lobe Downingtown design. Patents applied for.

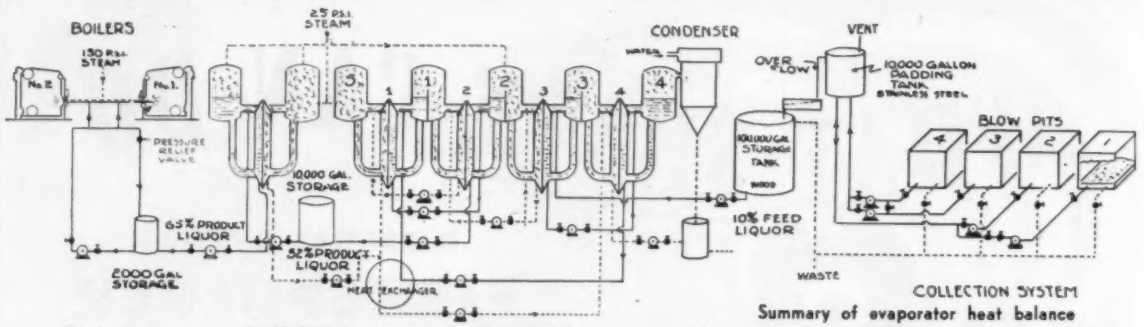
DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.

Pacific Coast Representative: John V. Roslund, Pacific Bldg., Portland 4, Oregon.

DOWNINGTOWN FIBREPULPER

It's the Shape that makes the difference

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880



Flow chart of spent sulphite liquor collection, evaporation, and burning

Summary of evaporator heat balance

Feed	101,000 lb./hr. @ 10% solids 175° F.
Product	15,550 lb./hr. @ 65% solids 211° F.
Evaporation	85,450 lb./hr. 25 psi ga.
Economy	3.47 lb. evap./lb. steam
Water	2100 gpm @ 85° F. max.

Northern Paper Mills to build stream purification plant

▶▶▶ NORTHERN Paper Mills announced on December 15 that it will construct a plant to reduce sulphite pollution of the Fox river at an estimated cost of $1,500,000. First moves to get under way will be taken by the company just as soon as state authorities approve its plans.

Milan Boex

The company pointed out in its release that the new plant is the culmination of many years of research to find a workable solution to the problem of disposing of spent sulphite liquor. Pulp manufacturers long have maintained that sulphite liquor presents the most difficult task in reducing pollution from industry wastes.

At a public hearing on December 22, 1949, Northern testified that it had researched, in co-operation with other Wisconsin mills, for years on this problem without getting a final answer. However, according to its testimony at that time, a ray of hope had developed in the research, so that a method practical to install and operate might develop reasonably soon.

"This plant has been developed from that start," declared Milan Boex, president of Northern, in his statement. "The company today submitted to the Committee on Water Pollution and the State Board of Health detailed plans and specifications for a plant using the evaporation and burning process for disposing of spent sulphite liquor. These plans are for a full-scale plant to reduce sulphite pollution.

"No sulphite mill in North America using the calcium base method of pulping which is standard in this state, has yet successfully operated a commercial unit for evaporating and burning, with all of its ramifications," Mr. Boex said.

In his company's report to the state bodies he stated, "The time allotted to Northern by the Committee's order did not permit full exploration of all the conditions that may be encountered in commercial operations. Indications are that an installation should enable Northern to reduce the pollutional effects from spent sulphite liquor by 40 per cent to 45 per cent.

"The process of evaporating much of the water from spent sulphite liquor to concentrate its content of dissolved wood solids and then burning it as industrial fuel was selected as best adapted to Northern's situation after investigation of three other promising processes," Mr. Boex told the Committee. By submitting its plans at this time, Northern achieved compliance days ahead of the official deadline.

In orders issued on February 21, 1950, State authorities requested Northern and Hoberg Paper Mills, both of Green Bay, as well as Consolidated Water Power and Paper Company's Interlake Mill at Appleton, to submit by December 31, 1950, detailed plans and specifications to reduce their pollution of the Fox River to an acceptable minimum. The State's order further stipulated that upon official acceptance and approval of these plans, construction is to be completed by December 31, 1951.

The estimated $1,500,000 cost to complete the proposed installation covered by Northern Paper Mills' plans at today's cost levels does not include a building. The company already has a building which with some modifications can be made adequate to house the proposed equipment for collecting and evaporating the spent liquor.

Equipment will be ordered as soon as plans approved

In the formal report, which is signed by Mr. Boex, Northern agreed to start to negotiate and place orders for required equipment promptly after its plans are officially approved.

Pointing out to the State authorities that stainless steel is essential in handling spent sulphite liquor, the report likewise called attention to the fact that emergency defense demands already have made stainless steel extremely difficult to obtain for civilian use, with every indication that this scarcity will become even more acute. "If Northern eventually should find itself unable to obtain necessary materials, the Company will ask the Committee to take up with federal materials control authorities the public importance of pollution reduction and assist in obtaining the requisite priorities so that any plans which the Committee accepts can be carried through with the required materials," Boex notified the state bodies concerned.

Northern emphasized that it sincerely wishes to carry through its plans to completion. But to guard against any possibility of finding itself forced by some United States federal defense regu-

lation to violate some part of a Wisconsin state order, Northern formally requested the Committee on Water Pollution and the State Board of Health to modify their order of February 21, 1950, so that the time limit for completing construction will be automatically extended if for defense or other reasons beyond the Company's control it should find itself unable to obtain equipment required for its proposed treatment plant.

New pulping practices are described

Accompanying Mr. Boex's report, Northern supplied to the state authorities a set of large scale engineering drawings of the proposed installation, a flow chart showing how the spent sulphite liquor will be handled, a description of the process and full specifications. Besides the treatment plant proper, these documents disclose, the company is changing some of its pulping practices in order to make the treatment process feasible.

Instead of placing water in a blow pit as a pad before blowing in the contents of a digester, as at present, the mill will pad the blow pit with liquor from a previous cook. This change will decrease the dilution of the incoming spent liquor which eventually must be boiled down to greater concentration. It is expected that liquor collected for processing will average about 10 per cent solids in solution. Instead of discharging spent liquor to the sewer from the blow pits, each blow pit will be equipped to pump the liquor to a 10,000-gal. stainless steel padding tank, through screens, and then to a 100,000-gal. wooden storage tank. This capacity is sufficient to store liquor from five digester blows, or about 12 hours collection.

The collected 10 per cent spent liquor will pass from storage to a five-vapor body quadruple effect evaporator of the reversing type designed to prevent excessive lime scaling. Here the liquor will be evaporated to 52 per cent concentration. The 52 per cent material will in turn pass through a two-vapor body concentrator of reversing type for further reduction to a solids content between 60 per cent and 65 per cent so that it can be burned in the power plant boiler through atomizing burners. The concentration operation involves handling 101,000 lb. of 10 per cent liquor hourly through evaporation to end up with 19,400 lb. of heavy concentrated liquor. The concentrate will be stored at 200 F. in a supply tank adjacent to the boiler plant.

Fly ash from burning the spent liquor is high in calcium content. It is about 50 per cent finer than fly ash which results from burning coal, and presents an accordingly more difficult problem to collect and dispose of. Plans for fly ash collectors on the mill's two existing boilers will be submitted to the City of Green Bay for approval under its air pollution ordinance. Because the fly ash is so fine, special handling will be required for hauling it from the plant after it is collected.

Collection and evaporation equipment will be housed in a 40 x 140 foot three-story brick building of fire resistant construction. This structure is already built, but requires one major modification. The proposed evaporator equipment would be too high for the present roof level, and so the roof must be raised 14 ft. to accommodate these units. The operating floor of the evaporation equipment will be about 25 feet above the ground floor.

The major installation, of course, is the liquor evaporating system. This will be a Conkey 5 body, 5 effect reversing evaporator with flat plate type heating surfaces manufactured by General American Transportation Corp. under the Rosenblad patents.

Two of the existing Riley power boilers fitted with specially designed liquor burning attachments will be employed. Fly ash precipitators made by American Blower Co. will be installed on the two boilers.

Sargent and Lundy, of Chicago, are consulting engineers on this project.

Hoberg submits plans for sulphite disposal plant

▶▶▶ HOBERG PAPER MILLS of Green Bay, Wis., also have announced plans to build a $1,250,000 plant for evaporating and burning spent sulphite liquor. This is the second big project of its kind planned and announced around the end of the year just ended.

J. M. Conway

The plans and specifications have been submitted by Hoberg to the Committee on Water Pollution and the State Board of Health for approval. It is expected that this new plant, when in operation, will reduce sulphite pollution from the company's pulp mill by approximately 40 per cent.

J. M. Conway, company president, states that as soon as the state authorities approve the project, construction will start. Reviewing the preliminaries that have resulted in this recent announcement, Mr. Conway said:

"A year ago at a hearing in Green Bay we told the Committee that all known methods of treating spent sulphite liquor were in an experimental stage, and that in our opinion a satisfactory solution to this problem would not be forthcoming until some type of full scale plant would be put into operation.

"These statements are also true today . . . considerably more is known now than a year ago about treating spent liquor to reduce stream pollution, but a great many points remain to be cleared up and the subject remains experimental. A full scale plant, with the opportunities that this will afford for development work, seems to us to be the only possible way to work out a completely practical solution."

At the December, 1949, hearing, Mr. Conway asked for one year in which to complete plans, and agreed to build once his company's plans were approved. In response, the state pollution authorities issued an order directing Hoberg to submit plans and specifications by December 31, 1950. The above action is in compliance with that order.

Fiber loss is lower

The same state order instructed Hoberg to complete by the end of 1950 installation of fiber recovery equipment to meet state standards of fiber loss to the stream. In its report to the official bodies, the company pointed out that every division of its pulp and paper operations is now fully complying with the requirements. By installing new and improved equipment and by rearranging its water system for maximum re-use and re-circulation, Hoberg has substantially cut its fiber loss and decreased its use of water per ton of paper produced.

It has been widely rumored that Hoberg would choose the yeast treatment process, by which torula yeast is propagated in sulphite liquor to consume the wood sugars. "Experience has convinced us that the construction of a yeast plant is impractical at this time because of the lack of secondary treatment for the effluent and uncertainty of the degree of

pollution reduction which would result," explains the company's report to the Committee on Water Pollution. Undoubtedly also contributing to the decision were the difficulties that the Rhinelander plant has encountered recently in disposing of yeast produced in the course of its treatment process.

"Construction and operation of the evaporate and burn plant will give us an opportunity for a thorough evaluation of this process," Mr. Conway pointed out. "The proposed construction will create the opportunity for us eventually to further develop the evaporate and burn process, or to pursue the yeast process with secondary treatment of its effluent, or to use both processes as future developments may make advisable. Hoberg wishes to reduce its pollution of the Fox river to the greatest practical extent, just as rapidly as science makes methods available."

National Gypsum Given Land Right for Plant in Oklahoma

A request made by Oklahoma Grand River Dam authority to sell forty acres of land near Choteau to National Gypsum Co., Buffalo, N.Y., has been granted by General Services Administration, Washington. The gypsum firm will build a $4,000,000 paper mill for the manufacture of heavy paper on the land.

The new plant, which will supplement National Gypsum paper mills at Kalamazoo, Mich., Newburgh, N.Y., and Garwood, N.J., will be located on part of the former Choteau ordnance works property which was acquired by the river dam authority as war surplus; the ordnance plant, under the proposed contract, could be reclaimed by the Government in a national emergency.

C-Z Reseeding Program Aided by Helicopter

The helicopter tree seeding program sponsored by Crown Zellerbach Corp., Portland, Ore., for the 1950-51 reforestation season has been completed. "Helicopters, Inc." of Seattle began on the 474 acre seeding project of C-Z's Clackamas tree farm, seeded 500 acres on the Columbia tree farm, completed a cooperative project of 800 acres in conjunction with the State of Washington at Cathlamet, Wash., and finished the work with the seeding of 500 acres on the Clatsop tree farm owned by C-Z near Saddle Mountain.

A total of more than 2000 pounds of selected tree seed was used on the 2000 acres of land. Douglas fir, western Hemlock, red cedar, Noble fir, and Sitka spruce were included in the 206,000,000 viable tree seeds used.

M. Comps, technical director for Cenpa Co., Begles, France, and R. G. Goodwin (right) P. and I. A., Inc., New York, pose in front of the new Chemipulper recently installed in Cenpa's mill.

French mill installs Chemipulper

In an effort to utilize hardwood waste from sawmill operations, the Cenpa Co., Begles, France (near Bordeau) has installed a Chemipulper for the production of high yield semichemical pulps. Low alkali content kraft cooking liquor is employed and sulphidity of the liquor is kept to a minimum because of the odor problem. Black liquor is not recovered.

Chemipulper stock is pumped from the cyclone to a Sutherland refiner and then goes direct to a fourdrinier pulp forming machine. Wet laps are conveyed to storage. No slush pulp chests are used in the system.

Kraft semichemical pulp produced by this process is now used mainly for corrugating board but it is contemplated for use in linerboard and bag paper.

Design of the new pulping system was handled by M. Comps, Cenpa's technical director. R. G. Goodwin of Paper and Industrial Appliances, Inc., New York, supervised installation of the Chemipulper.

Paper Division Announced by Fabric Research Labs.

A new paper division will be opened by Fabric Research Laboratories, Inc., Boston, under the direction of Dr. Geoffrey Broughton, head of the Paper Engineering Department of Lowell Textile Institute, Lowell, Mass.

Working with a modern, completely equipped pulp and paper laboratory which will be co-ordinated with the firm's existing facilities for chemical, physical and microscopial research, the new division will offer research services similar to those which the Fabric Research performs for the textile, plastics and chemical industries.

St. Regis Progressing with work on new plant and expansion in South

Following recent announcements that St. Regis Paper Co. would build a new mill at Jacksonville, Fla., and expand its present plant at Pensacola, Fla., comes word that preliminary work is already in progress. (Cf. P.I. Nov. and Dec., 1950)

A late release states that Merritt-Chapman & Scott Corp., New York City, has been awarded the general construction contract in connection with the company's expansion program in Florida.

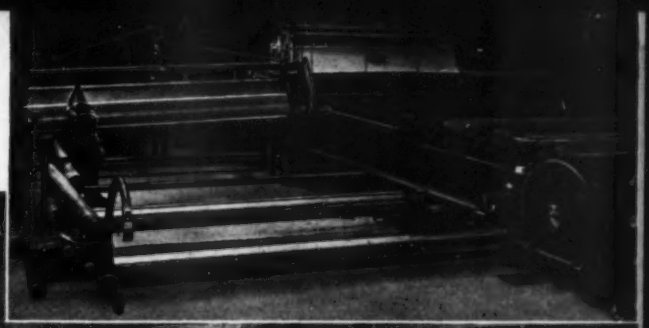
Orders for two new paper machines have been placed. The machine to be added at Pensacola has been ordered from the Bagley & Sewall Co., Watertown, N.Y. This machine will be designed to produce specification multiwall kraft paper, will be 228-inches wide and designed for an ultimate speed up to 2,500 fpm. The machine for the new Jacksonville mill has been ordered from the Beloit Iron Works, Beloit, Wis. It will be 230 inches wide, designed also for a speed up to 2,500 fpm.

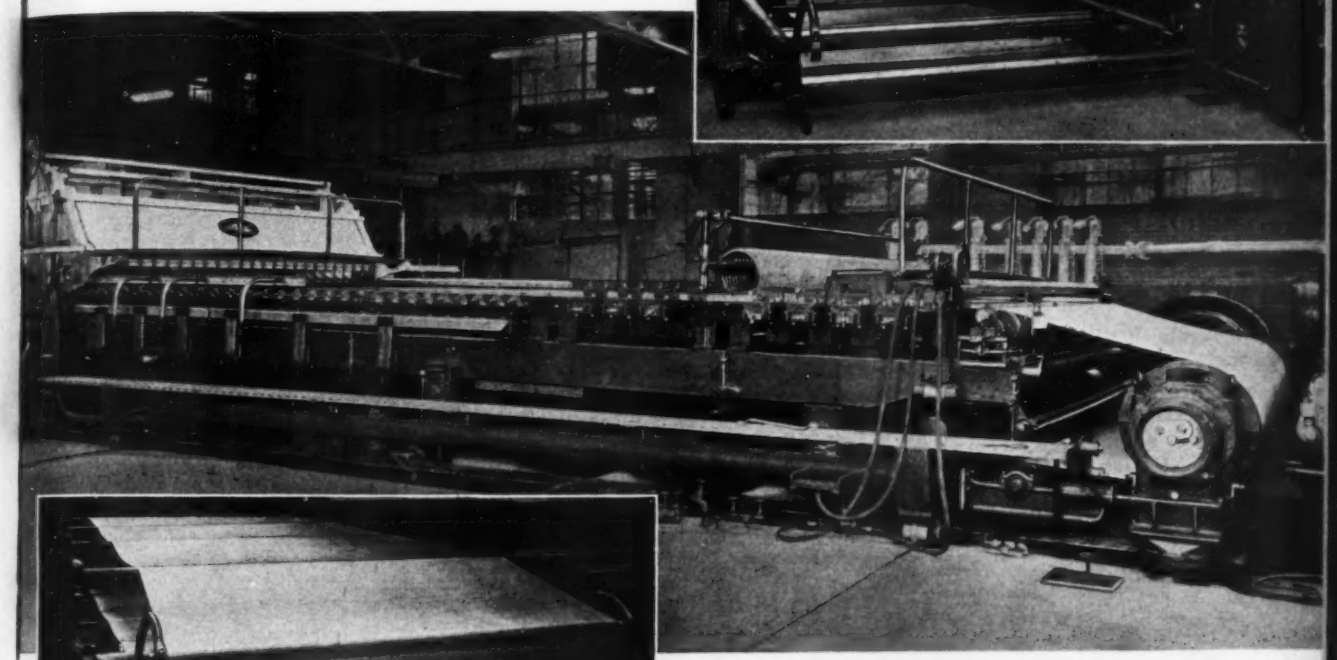
Work already has commenced on the foundations for the new installation at Pensacola and a start on the new Jacksonville mill will be made soon.

HOLDERS OF PREFERRED AND COMMON stock of Container Corporation of America, Chicago, have approved a two for one split of the common shares. At the same time, stockholders approved an increase in authorized common stock from 1,500,000 shares of $20 par value to 3,000,000 at $10 par value. On the basis of the new split, book value of each share will be about $28.75.

A NEW COMPANY, Barger Box & Printing Corp, headed by R. M. Welch, has purchased the sixty-year-old Barger Box Co. at Elkhart, Ind. G. Aird Moffat, former president and general manager of the Barger firm, is retaining ownership of the plant, and will continue as head of Industrial Plastics Corp., which is located in a wing of the Barger plant. The new box and printing corporation began operations December 1.

At right: undercarriage rolled into tending side aisle on suitable tracks ready for wire draping operation.





Above: Fourdrinier Part of improved "Rapi-Drape" design shown in operating position.

At left: wire draped on undercarriage ready for installation.

Wire Changing Time:

55 Minutes

"Rapi-Drape" Wire Handling is now being used successfully in these outstanding mills:

Southland Paper Mills, Inc., Lufkin, Texas
Hollingsworth & Whitney Company, Mobile, Ala.
Southern Advance Bag & Paper Co., Hodge, Ala.
St. Mary's Kraft Corp., St. Mary's, Ga.
Union Bag & Paper Corp., Savannah, Ga. (2)
Hudson Pulp & Paper Co., Palatka, Florida (2)
Southern Paper Board Corp., Port Wentworth, Ga.
Fibreboard Products Inc., East Antioch, Cal.
St. Regis Paper Co., Tacoma, Wash.
Calcasieu Paper Co., Elizabeth, La.
San Rafael Paper Co., Mexico, D.F.
Papierfabrik Utzenstorf, Switzerland
National Newsprint Co., Ltd., India
Everett Pulp & Paper Co., Everett, Wash.

Here is a simplified, fast, safe method of changing Fourdrinier Wires. Down-time is greatly reduced. Operators report a complete wire change in 55 minutes or less. Takes less aisle space and there are no heavy parts to handle. No danger of deflection stresses or distortion as experienced with complete removal or cantilever change. Unnecessary to disconnect shake connections, suction boxes or showers.

In "Rapi-Drape" Wire Handling, pioneered by Puseyjones, the Fourdrinier as a unit remains in the operating position. The breast roll and the stretch roll are lowered, and the couch roll cantilevered to provide clearance. The back of the Fourdrinier is supported on frames. Features include a removable, power-operated undercarriage which supports the front side in perfect alignment at all times. Only parts which must be removed are the dandy roll, deckle and cut squirts.

Get the complete "Rapi-Drape" story . . . talk to a Puseyjones engineer.

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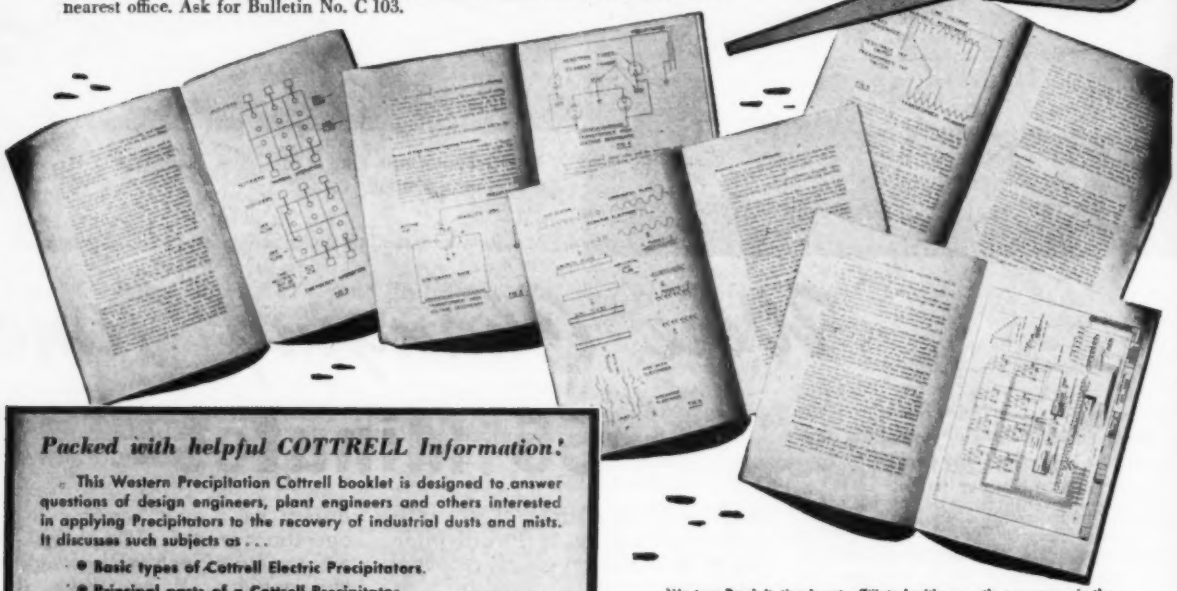
COTTRELL ELECTRICAL PRECIPITATORS



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Board machine rebuilt in West Virginia Charleston (S.C.) plant modernization

▶▶▶ BACKED BY EXTENSIVE and costly preliminary work throughout the mill, the No. 1 Board Machine resumed production at the North Charleston Plant of West Virginia Pulp and Paper Co., December 10, after a shutdown of 13 days for a major rebuilding job.

The machine has been idle since November 27 when mill work crews began fitting it with a new stock furnish system, a complete new fourdrinier section, believed to be the longest in the world, an improved press section and additional dryer capacity. The improvements are the first major ones to be made on the machine since it began operations in the summer of 1937.

L. Frank Thompson, newly appointed manager of the North Charleston plant, said the first results from the improvements on No. 1 machine would be a better quality of product and a better balance in the production of kraft board and paper. In time, he said, production increases are expected.

Before it was overhauled, No. 1 machine was making an average of 486 tons of kraft liner board per day. The plant's other machine designated as No. 2 has been producing an average of 232 tons of kraft paper and board per day.

Third phase of program is completed

The rebuilding of No. 1 machine completes the third phase of a broad mill improvement program begun 18 months ago. Officials stated that the first aims of the program are to increase the efficiency of the operation and the quality of product, through more effective controls provided by modern equipment installed throughout the mill, and to lay the foundation for increased production of pulp and paper.

To maintain its operations at a high competitive level, the company had to buy considerable new equipment to replace or supplement machinery that had become less efficient with time, some through wear and tear that comes from constant 24-hour operation and some through comparison with advancements made in paper mill equipment during the 13 years since the Charleston plant began operations.

In the first phase of the mill's improvement program, the power plant was enlarged and improved to provide additional electric and steam capacity for the new operations. These improvements included the installation of a new steam generator capable of producing more than 300,000 pounds of steam an hour, and a new 12,500 kv-a electric turbine, plus improvements to existing equipment.

At the same time much heavy new equipment had to be installed and older units improved in the recovery department, which provides about 50 per cent of the plant's steam capacity while recovering chemicals from spent cooking liquor for re-use in the pulping process.

New installations include two large recovery units, each capable of processing liquor from more than 300 tons of pulp daily, while providing more than 220,000 pounds of steam per hour. An older unit is being rebuilt to increase its recovery and steam capacity.

An additional electrostatic precipitator, capable of collecting almost 50,000 pounds of dust in 24 hours, has been installed to remove chemicals from the flue gases of the new recovery units.

Other recent recovery installations include a new lime kiln, 10 feet in diameter and 200 feet long, with a capacity of 125 tons per day, and a lime mud washer used in the production of white liquor for the pulping process.

One of the larger projects yet to be completed includes the revamping of two evaporators which concentrate the spent cooking liquor in the first step of the recovery process.

The second phase of the improvement program came with the installation of new and efficient equipment at the head of the pulp mill line. This project covered the installation of a new barking drum, log conveyors and a new chipping operation, which included construction of a new building and installation of two giant 10-knife chippers, measuring 110 inches in diameter.

Pulp mill improvements will follow

Now that the machine rebuilding is done, the mill will proceed with plans to provide additional refinements in the pulp mill, designed to give that division the highest quality product and boost its capacity from 750 to 1,000 tons per day.

The major improvement in the pulp mill will be a new continuous, vacuum filter washing system to replace a less efficient batch washing system that has been in operation since the mill started. A total of nine large filter washers will be installed. The first line of three washers is scheduled to go into operation around the first of the year.

A new digester, giving the plant a line of nine pulp cookers, also will be ready for operation about the first of the year. The additional digester will give the plant ample capacity for cooking 1,000 tons of good quality pulp per day.

Plans have been authorized to expand the pulp mill screen room to attain greater capacity and better quality. Three new vibratory screens of a rotary type will be placed in operation to supplement the present system of flat screens used in the final processing of pulp.

New stock preparation system designed

One of the big jobs connected with the rebuilding of No. 1 machine was designing and building a new stock preparation system capable of furnishing pulp and water slurry in sufficient quantities for high speed operation and at the same time maintaining a proper consistency for quality production. As a first step three new refiners, complete with stainless steel piping, were installed in June to replace the last three jordans in operation in the mill. This change made 12 highly efficient stock refiners available for the No. 1 machine and 8 for No. 2 machine.

During the shutdown, a new fan pump capable of moving 40,000 gallons of slurry a minute was installed at the head of No. 1 machine. New equipment at the wet end of this machine included a flow-evener of latest design and a pressurized headbox which automatically maintains a constant stock level, with air pressure and vacuum regulating the rate of flow onto the machine wire. This equipment is expected to contribute much to the better quality of product.

The fourdrinier section of the No. 1 machine was completely rebuilt and the wire upon which the paper is formed now measures 140 feet in length and 246 inches in width. The wire of the old fourdrinier section was 93 feet long.

A more efficient press section was designed by adding a new third suction press and rearranging and mounting in new support frames two suction presses and one smoothing press used previously.

The rebuilt machine now has a total of 105 dryers, ranging in size from 48 to 60 inches in diameter and operating under steam pressures ranging from 60 to 125 pounds. Three calender dryers of 60-inch size and 125-pound pressure replaced three smaller, 60-inch dryers. Two of the old calender dryers were installed at the wet end of the dryer section, replacing a single 42-inch receiving dryer.

The rebuilding has added 24 feet to the over-all length of No. 1, which now measures 397 feet from the headbox to the reel.

D. C. Paper Mills to Close Down— Government Will Lease Buildings

One of Washington's few large industries, The Disrict of Columbia Paper Mills, Inc., has decided to discontinue operations. The mill's buildings on Water and Potomac Sts., N.W., have been leased to the government, and machinery and equipment will be sold.

Notice has been given to 150 employees that manufacturing operations will cease upon completion of present orders and liquidation of inventories. Stockholders were called to a special meeting December 18 to authorize sale of equipment and to approve action of the board of directors in leasing the property to the General Service Administration.

It is understood that the General Service Administration plans to take over the property on about March 15. After extensive remodeling, the buildings will house about 1200 Defense Department employees.

In commenting on the shutdown decision, Company President L. D. Nicolson said, "In recent years it has become increasingly difficult to compete in the paper manufacturing business. Over a prolonged period our limited production facilities have reflected unsatisfactory operating results. This has resulted in a weakened financial condition. Furthermore, there appears to be little possibility of substantially improving our position in the paper making industry."

Mr. Nicolson added that "the best interests of stockholders, bondholders and creditors require our withdrawal from . . . business. The liquidation of inventories and the disposition of all remaining machinery and equipment so as to enable us to develop the earning power of our real estate holdings, which have been leased to the United States Government."

Income from rentals under the lease, Mr. Nicolson commented, should be great enough to cover interest and sinking fund requirements on the company's mortgage bonds and leave "a substantial" amount to strengthen the firm's financial position.

All operations are expected to cease early this month. Ironically, operations in recent months have been at near capacity. October revenues were said to have been the highest for a month in the firm's long history.

However, earnings have been erratic over a long period and not sufficient to justify a dividend for stockholders since 1914. Last year's operations resulted in a loss of about $36,000.

The present operation dates back to 1900, when the company was incorporated as D. C. Paper Manufacturing Co.; George L. Nicolson, father of the firm's present president, headed that firm. Under a reorganization in 1936, the name was changed.

Actually, papermaking has been carried on at the site since Civil War days, when the old Hill mill operated there.

D. C. Paper has long held a reputation as a maker of fine cover papers, bottling papers, box covers and specialties. One of the main difficulties has been a lack of modern high-speed machinery. In the present era of high costs, the firm's management decided it was inadvisable to make the large investment necessary to bring the machinery up to date.

New Converting Plant May Locate in Oregon

A press release indicates that a large paper converting firm may make Forest Grove, Ore., the site of a new plant. Raymond L. Miller, chairman of the town's chamber of commerce industrial committee, was unable to reveal the firm's identity, but did comment that the company in question has been studying Forest Grove as a location for several months, and that Portland, Ore., and California managers of the company have recommended to their headquarters in New York that the town be chosen.

If Forest Grove is selected, the new plant will probably give year-around employment to from 25 to 50 local families.

Abitibi Acquires B.C. Mills

Controlling interest in the British Columbia Pulp Co., Ltd., and Alaska Pine Co., Ltd., both of Vancouver, British Columbia, has been acquired by Abitibi Power and Paper Co., Ltd.

The acquisition of the two paper companies is reported to have been a transaction of between $30,000,000 and $35,000,000; about 90 per cent of the common shares of British Columbia Pulp were involved in the sale. The new mills will be the first West Coast addition to the Abitibi holdings.

PLANS FOR CONSTRUCTION of a new 25,000 square foot addition to the Chicago plant of Cromwell Paper Co. are being completed. The new building, to be located across the street from the company's Chicago headquarters at 4801 So. Whipple St., will be a one-story building costing about $200,000. When it goes into operation sometime next spring, the new plant should increase Cromwell production by about 25 per cent.

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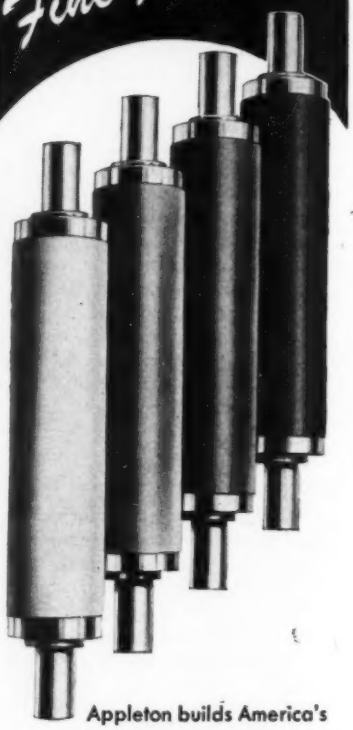

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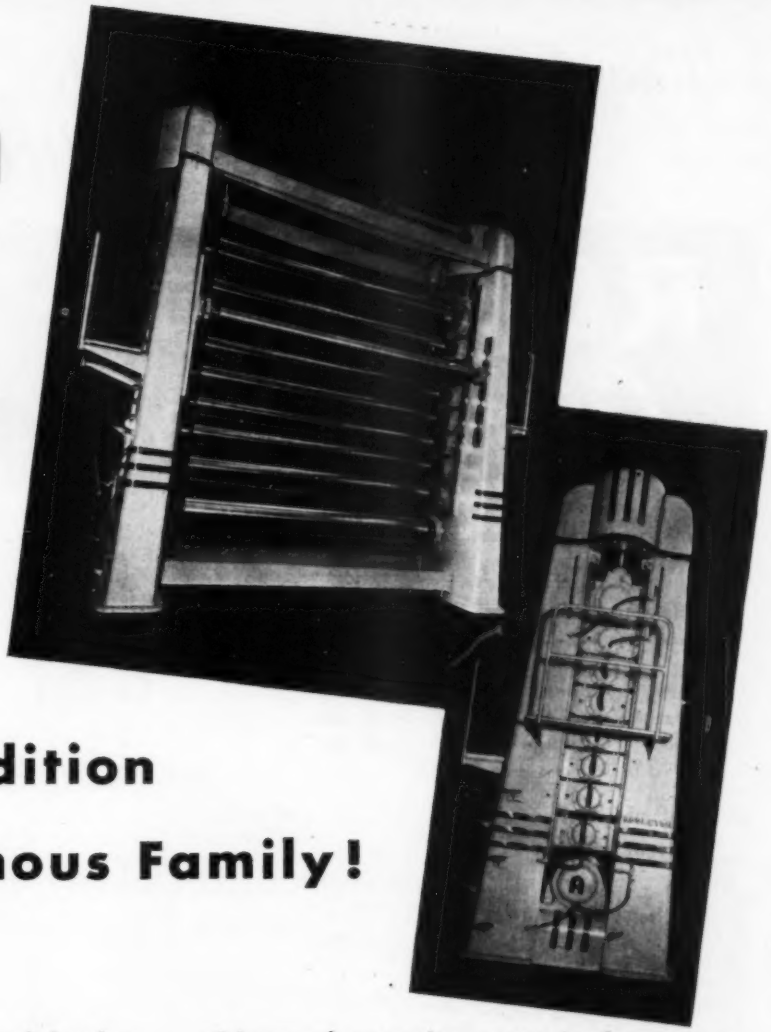

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The new Machine Calender is available in a wide variety of sizes . . . anti-friction type bearings are used throughout and you have a choice of pneumatic or hydraulic loading. This new unit is a real time-saver. Improved endwise method of removing rolls makes it possible to change rolls faster. And, it's a space-saver, too! Compact design requires a minimum of operating space in the paper machine line. Of course, you'll recognize the sturdy, welded steel frame as being styled after the closely allied *Appleton* Supercalenders.

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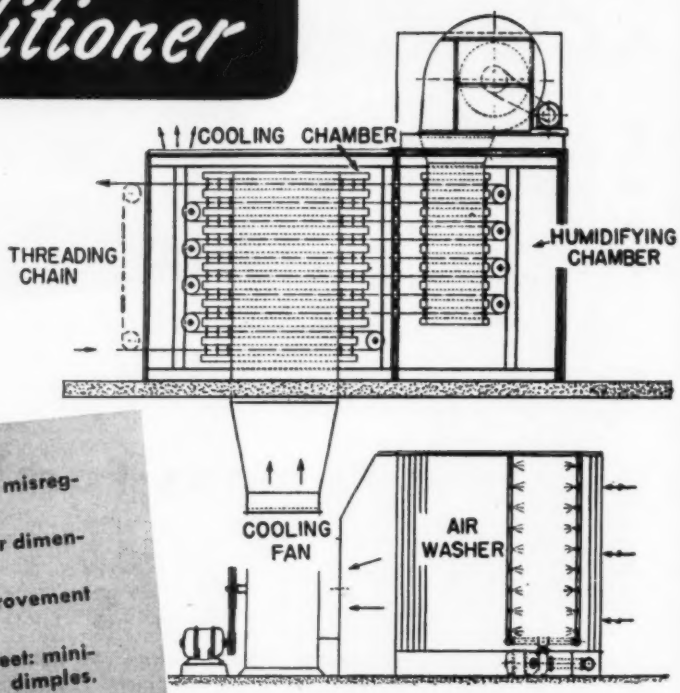

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The Ross Cycle Conditioner adds any reasonable moisture content, uniformly and controllably, on webs up to 200 inches wide at speeds up to 2000 ft. per minute. It can be used as a separate operation or in synchronism with other operations. It will pay you to investigate the economic advantages of installing this conditioning equipment.

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Purchase of L. S. Yeast Corp. stock announced by Rhinelander Paper Co.

▶▶▶ PURCHASE OF ALL outstanding stock of the Lake States Yeast Corp. from ten sulphite pulp manufacturing companies was announced recently by Rhinelander Paper Co., Rhinelander, Wis. The Lake States Corp. owns the experimental yeast plant which produces dried torula yeast at Rhinelander.

"The yeast plant's experimentation to develop ways for improving Wisconsin streams will continue in exactly the same direction as before the transfer of stock ownership," stated Folke Becker, president of Rhinelander Paper Co., in making known this transaction. "Our company bought the yeast business, and the other paper companies sold to us, because we all believe that the process has reached the stage where it can be steered to technical and commercial success more surely, quickly, and efficiently by a single company's management than by committee management. The yeast plant is at Rhinelander, adjacent to our sulphite pulp mill, and so we were the logical purchaser. This had been recognized ever since construction of the yeast plant was started three years ago.

"The purchase agreement provides that all technical information which we develop will continue just as before to be made available to the Sulphite Pulp Manufacturers' Research League, which includes all of the former owners. Also, the League's staff scientists will continue to give the yeast plant the benefit of their research findings, and will keep themselves informed on the plant's operations and progress."

Sulphite pulp manufacturers emphasize that the League's research activity will continue in the same direction and intensity as before. "Sale of the yeast business to one member paper company will in no way adversely affect our industry's co-operative search for ways to solve the stream pollution problem," commented J. M. Conway, Green Bay, who is president of Hoberg Paper Mills and also of the League. In a statement released simultaneously with Rhinelander Paper Co.'s announcement he further said, "The mills which have supported the League's scientific work since its founding in 1939 are determined to continue its program until they have found methods that are both technically and economically sound for successfully reducing sulphite pollution in Wisconsin's streams.

"The yeast process has been carried further toward this ultimate goal than any of the 44 different methods that the League's scientific staff has worked on since 1939," continued Mr. Conway. "We are convinced that the Rhinelander yeast plant can now go ahead faster to fulfill its experimental purpose under a single mill's direction. This will leave the League's technical men greater freedom to concentrate their efforts on other promising studies that are currently under way.

"We look for a general stepping up of the League's research program and consequently greater progress toward eventually solving the sulphite pollution problem in this state, as the direct result of Rhinelander Paper Company purchasing Lake States Yeast Corp."

Supporting this view is the fact that Rhinelander Paper Co. has recently set up a by-products division managed by J. M. Holderby, veteran research technical man in the handling of spent sulphite liquor. Besides the newly acquired yeast plant, this division has on order an evaporator with capacity to handle a substantial volume of the effluent from the company's sulphite mill.

"Rhinelander Paper Co. plans to use the evaporator experimentally in finding ways to process spent sulphite liquor for industrial fuel and other products which may have commercial value," explains Mr. Holderby. "Our efforts will be to work out plant-scale applications of scientific findings made by the Sulphite League.

"There still remain unsolved some difficult technical and cost problems. Also, the evaporating equipment will be applied to the yeast plant effluent in hopes that this material can be utilized to yield marketable products."

The paper companies that sold their interest in Lake States Yeast Corp. to Rhinelander Paper Co. are: Badger Paper Mills, Peshtigo; Consolidated Water Power & Paper Co., Wisconsin Rapids; Detroit Sulphite Pulp & Paper Co., Detroit; Falls Paper & Power Co., Oconto Falls; Flambeau Paper Div. of *Kansas City Star* Co., Park Falls; Hoberg Paper Mills, Inc., Green Bay; Kimberly-Clark Corp., Neenah; Marathon Corp., Rothschild; Nekoosa-Edwards Paper Co., Port Edwards; and Northern Paper Mills, Green Bay.

Three-Way Modernization Projects under way at C-W

Three phases of modernization are currently under construction at the Crown Williamette Paper Co. mill at West Linn, Ore. Together, the three projects will cost in excess of $1,000,000.

The water filtering plant will be expanded, the sawmill will be rebuilt and a new pulp bleaching plant will be constructed.

The new wood plant will be built upstream from the present installation, using part of a new sheet steel bulkhead for foundations, log haul and log storage. The log haul will extend about 175 feet upstream at the guard wall of the Williamette Falls canal; the bulkhead, in part replacing an old wooden one, is about 750 feet long and parallels the canal leading into the locks.

Better color and grades of coated magazine-type paper can be produced when the new bleaching plant is integrated into the mill's paper production line. Some of the chemical storage tanks have already been placed and foundations have been installed for the bleach cell and washer. According to Malcolm J. Otis, resident manager of the West Linn mill, the new bleachery will permit use of the peroxide process for bleaching pulp used in manufacturing coated paper used by several national magazines.

Improvement Program Completed at Plant of Pacific Paperboard Co.

A brochure issued by Pacific Paperboard Co., Longview, Wash., reveals that the firm has completed a $880,000 improvement at the Longview plant. The greatest single expenditure—about $342,000—was for a new processing system for preparation of stock; four modern pulpers with a combined daily capacity of 250 tons, the most modern screens, thickeners and other refining units are included in the system. Seven stock chests, with a total capacity of 35 tons of prepared pulp, are also part of the processing system; integrated by means of special pumping units which will provide wide flexibility, the chests are expected to substantially reduce operating cost.

Another project completed is a groundwood mill with a daily capacity of 50 tons, installed at a cost of $205,000. At a cost of $96,000, improvements to all four paper machines have been made; a new machine was installed, $244,180.

Marathon Will Have Carton Factory in Washington

So that its manufacturing facilities may be increased, Marathon Corp., Menasha, Wis., has purchased a factory building at Sunnyside, Wash. The new plant is an addition to, not a replacement of, manufacturing facilities for the fabrication of food cartons at the firm's Wausau and Menasha (Wis.) plants.

A western site was chosen for the new converting plant because that area's growing population and expanding food

industry make it an important market for Marathon's food packaging materials. It is expected that production at Sunnyside will begin during the first half of this year.

The former superintendent of the firm's Menasha carton plant, John W. Reimer, has been named resident manager of the new plant.

CONSTRUCTION WILL BEGIN next spring on a $1,250,000 paper converting plant being built in Rochester, N.Y., for Fort Wayne Corrugated Paper Co., Fort Wayne, Ind. Scheduled for completion next fall, the construction will contain 110,000 square feet of office space and will house manufacturing operations and sales offices. When the building is occupied the firm will increase employees by about 150.

AS RESULT OF A SURVEY of 42 American cities, Springfield, Mo., has been selected by Lily Tulip Corp., New York, as the site of a new company plant. The one story building planned will contain 450,000 square feet of floor space.

St. Regis Buys Maine Plant—Will Equip to Make Kraft Pulp

Property about 45 miles north of Bangor, Me., has been acquired by St. Regis Paper Co., New York, from Atlas Plywood Co., Boston, Mass., for use in the production of kraft pulp to be utilized by St. Regis northern paper mills manufacturing kraft paper. Necessary additional equipment preparatory to putting the pulp mill into production will be installed within three months.

The property, known as the Howland mill, adjoins the Atlas facilities and consists of several buildings originally used for pulp processing, although they have been idle for some time. Sufficient land for woodpiling purposes, as well as river rights and piers, is included in the purchase.

The Howland mill was formerly known as the Northern Kraft Div. of Gilman Paper Co.

Pulp produced in Maine — which should total about 30,000 tons annually —will be used by St. Regis in place of kraft pulp heretofore shipped from its Tacoma, Wash., mill to northern New York and Massachusetts mills. With the recent installation at the Tacoma plant of a new paper machine which manufactures multiwall bag paper, the mill's pulp production is needed locally.

The Howland mill will be under the supervision of George D. Bearce, manager of St. Regis operations at Bucksport, Me.

Radioactive Isotopes Used in Trial Run of Newsprint at Baie Comeau

A new and valuable twist was given to the term "hot news" when four tons of newsprint containing a minute amount of radioactive iodine were made November 8th on a paper machine of Quebec North Shore Paper Co., Baie Comeau, P.Que. The newsprint machines of this company are among the fastest in the world and at the time of the test were operating at 1710 fpm.

The trial was the first use of radioactive isotopes in an industrial process flow in Canada and is believed to be the first test of its kind in the world. I^{131} was obtained from the Chalk River pile of the National Research Council of Canada.

I^{131} was employed as a tracer on fibers from one of the six screens feeding one of the paper machines. The finished reel of paper was extensively sampled to determine the rate and distribution of flow through and across the 262-inch paper machine. Approximately one pound of fibers tagged with 100 millicuries of I^{131} were mixed with the stock feeding the machine for 10 minutes of the 18 minutes required to form a reel of paper weighing four tons. I^{131} was employed partly because of its half life of 8 days. The tagged paper when eventually repulped for the paper mill system will have negligible activity.

The trial was highly successful in indicating to a degree not previously possible the flow contours of fiber as these pass through the paper machine. The information obtained will be valuable in making paper machine operation more uniform and in designing and evaluating improvements especially on wide, fast machines. It has also been established that the technique permits tracing paper fibers around a mill without interruption of the manufacturing process. This in itself is an extremely important result and it should be a useful tool in all pulp and paper processing. The quantities of I^{131} required are small, and the tagging method developed does not require a "hot lab." Use of quantities substantially less than 100 millicuries may be anticipated for less detailed tests than that undertaken at Baie Comeau.

Several hundred pulp and paper samples were taken and the results are presently in course of analysis. Full technical information will be released at a later date.

The project and mill trial were under the direction of Dr. C. A. Sankey, research director of the Company. The tagging technique was developed at the Pulp and Paper Research Institute of Canada, McGill University, Montreal, by Drs. S. G. Mason and G. Allen under research sponsored by The Ontario Paper Co. Limited of Thorold, Ontario, of which Quebec North Shore Paper Co. is a subsidiary.

Nepco Announces Expansion Program at Nekoosa Mill

Just ahead of the new year, an important announcement from Nekoosa-Edwards Paper Co., Port Edwards, Wis., outlines an important expansion program.

The new program, which will cover a two-year period, calls for:

1—Construction of a warehouse at Port Edwards, expected to be completed by the fall of this year.

2—Installation of a new paper machine at the Nekoosa, Wis., mill.

In his annual report of the company's progress, Company President John E. Alexander stated that these projects are segments in the long range planning necessary to meet the demands being placed on the industry in the nation's economy today.

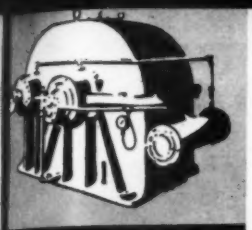
The new paper machine for the Nekoosa mill will replace the present No. 3 machine. It will produce paper 160 inches wide at 1200 fpm, at the rate of 140 tons per day. It is estimated that the new machine will be operating in 15 to 20 months. The machine is to be built by Pusey and Jones Corp.

A special building will be required to house the new machine. This structure will provide approximately 52,000 sq. ft. of floor space including basement. Present plans and estimates call for additional power equipment and other auxiliary equipment necessary to operate the new machine.

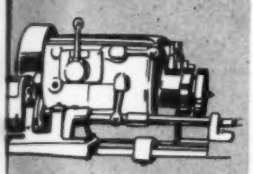
KVP Honors Long-Time Employees

More than 250 persons were present at a dinner given by Kalamazoo Vegetable Parchment Co., Parchment, Mich., recently in honor of eleven men who have been employed by the company for 30 years.

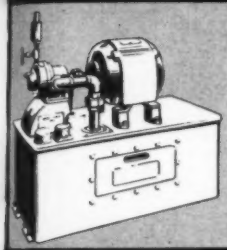
Those with 30 years of service were given gold watches by R. A. Hayward, company president; ten other employees who have been with the firm ten years were similarly presented with cash gifts. The evening's entertainment featured Alfred Southon, executive vice president, as toastmaster, and music by the KVP Little Symphony.



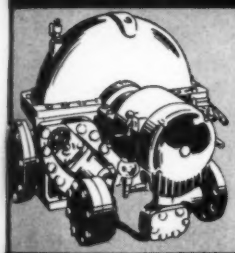
SPEED REDUCER



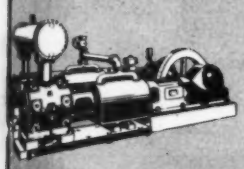
EAD STOCK GEARS



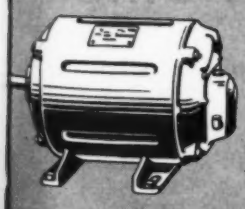
YDRAULIC SYSTEM



UXILIARY TURBINE



COMPRESSOR



MOTORS

Now better than ever

NEW

STANOIL
TRADE MARK
Industrial Oil

Brings two new benefits to wide range of jobs

For 14 years, STANOIL Industrial Oils have proved their ability to handle a wide variety of jobs in midwest plants. Now, these established products have been made better than ever! They offer these new and important savings in an even wider variety of industrial equipment.

1 LONGER OIL LIFE

Because they have greater oxidation stability, the new STANOILS stand up under high temperatures of operation, maintain low acidity for longer periods of service which helps keep oil systems free from deposits caused by oil oxidation.

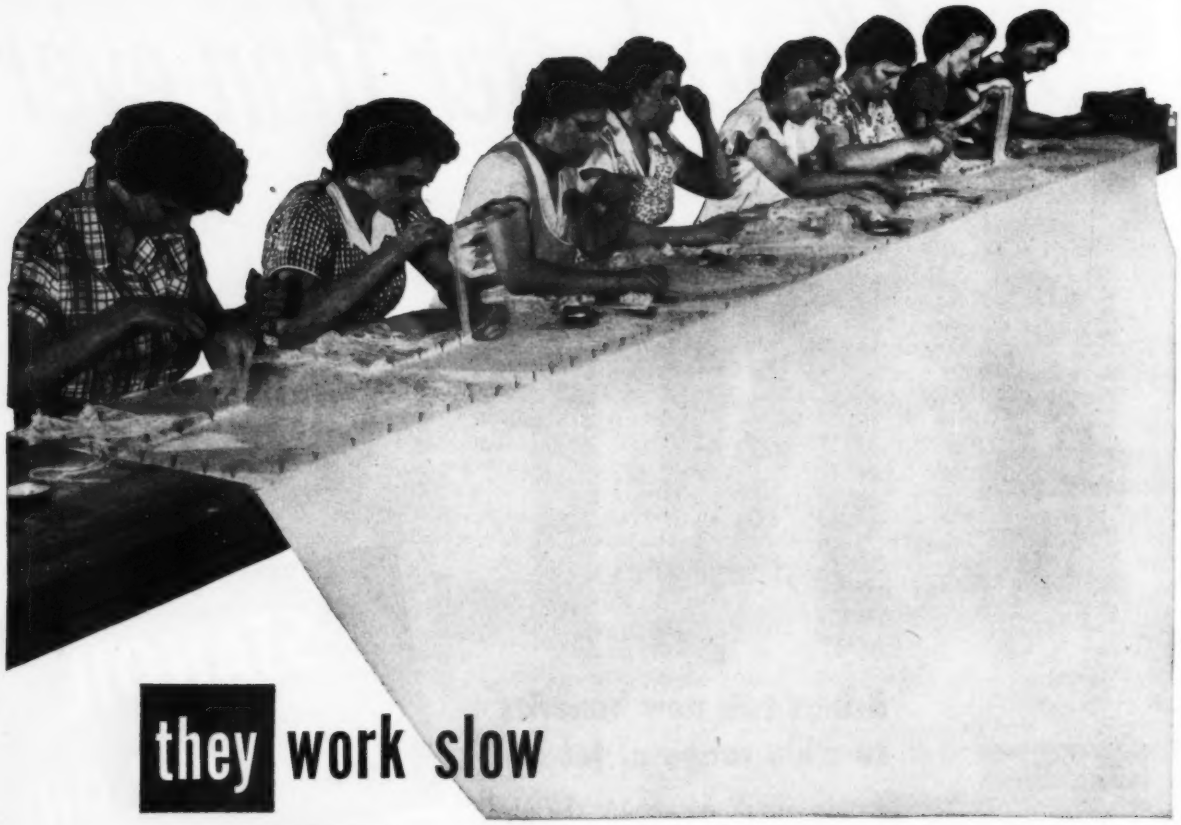
2 GREATER PROTECTION against RUST

A corrosion inhibitor of the most advanced type has been added to all grades of the new STANOILS that benefit by such an additive. This inhibitor prevents corrosion trouble by "plating out" on surfaces that tend to rust. In such severe service as paper-machine and steam-turbine lubrication, new STANOILS have put an end to rust and corrosion troubles.

At the left are shown several types of equipment in which the new STANOILS can save you money and maintenance time. A Standard Oil lubrication specialist will help you find still other applications where versatile STANOILS can replace many special-purpose oils. You can reach this man quickly and easily through your local Standard Oil Company (Indiana) office. Contact him today. Or, if you wish, write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA)

STANDARD



they work slow

so that you may work fast...

The fabric upon which these women are working has just been removed from the loom on which it was woven in a single strip. They are converting it into an endless belt, weaving the ends together by hand. Their workmanship is so perfect that the keenest examination will be unable to discover where the loom left off and hand weaving began.

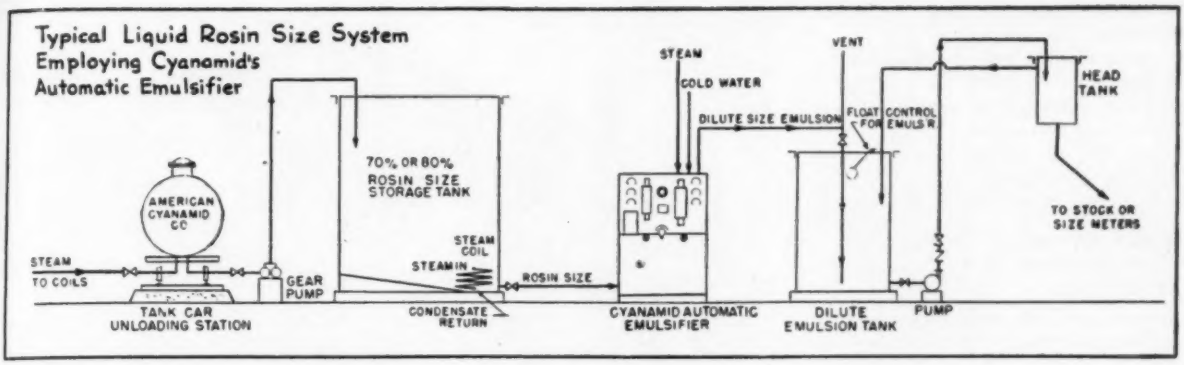
This patient, precise, time-consuming method of working is characteristic of every operation in the manufacture of Hamilton Felts, from the selection of the wools to the shrinking, fulling and finishing. It is a *tradition,* handed down through four generations. It explains why Hamilton Felts run true at all speeds of paper and board machines—why they remove more water—why they leave no felt marks on either side of the sheets.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Miami Woolen Mills

Hamilton Felts

Established 1858



Here is the flow sheet of a rosin size preparation system using . . .

Cyanamid's new continuous size emulsifier

▸▸▸ From 350 to 1650 pounds per hour of 70 to 80 per cent rosin size can be handled by the new American Cyanamid Co. continuous, automatically operated size emulsifier. Designed to eliminate many of the undesirable features of the commonly used batch emulsification process, the new unit has numerous desirable features, including:

(1) Close control of size-solids concentration

(2) Removal of human element to insure excellent emulsion stability at all times

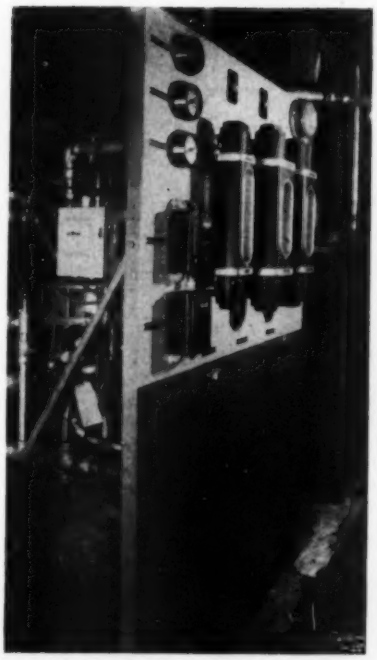
(3) Reduction of labor costs for emulsifying size. This cost will vary with the individual mill's size requirements, and the new unit may save part or full time of one or more operators per day

(4) Elimination of need for several large dilute emulsion storage tanks

(5) Recovery of valuable floor space now required for emulsion storage tanks.

The new emulsifier, built to Cyanamid's specifications by the American Heat Reclaiming Corp., and tested for several months in actual mill operation, is a compact preassembled unit. Installed in the unit are a hot water system, hot water circulating pump, rosin size heater, steam and cold water pressure regulating valves and cold water booster pump. Consequently, when this unit is installed it requires only steam, cold water, power services and the necessary connections to the concentrated and dilute size storage tanks.

Emulsification is started by mixing a stream of hot water and concentrated size in a venturi-jet mixer. The mixture then flows through an emulsifying valve where it is emulsified to form a primary emulsion. After leaving the emulsifying valve further dilution with cold water gives the desired concentration. The dilute size then flows through a back pressure valve either to the plant storage tank or directly to the stock system, whichever is plant practice.



First commercial installation of Cyanamid's new automatic continuous size emulsification unit

The unit is electrically interlocked so that it is automatically stopped and started by means of a float switch located in the dilute size storage tank. This switch actuates the size pump which, in turn, simultaneously controls the solenoid pilot valves which open or close the hot and cold water stop valves.

Rates of flow are indicated by rotameters for the hot and cold water and by a speed indicator on the variable-speed gear pump for the thick size. Should some integral part of the system malfunction, safety interlocks have been incorporated in the unit which will prevent it being started or, if running, will automatically shut it down.

Actual dimensions of the unit are about five feet wide by four feet deep and six feet high. It can deliver uniform size emulsions at concentrations as low as 1.5 per cent solids. Accuracy of dilute size solutions are controlled to within ± 0.1 per cent of the desired solids content of the emulsion.

Amer. Cyanamid Sales of Two Units Consolidated Under Canadian Subsidiary

Products of the Industrial Chemicals Division of American Cyanamid Co., New York, as well as of the Coating Resins Department of the Plastics and Resins Division, will be distributed throughout Canada by the firm's subsidiary, North American Cyanamid, Ltd. Sales offices will be located in Montreal at 7335 St. Lawrence Blvd., and in Toronto in the Royal Bank Bldg.

For some time North American Cyanamid Ltd. has distributed products of American Cyanamid's Calco Chemical Division, Agricultural Chemicals Division, Mineral Dressing Divisions, Plastics and Resins Divisions, and Lederle Laboratories Division. Canadian industries served by the products of these

divisions include the pulp and paper industry.

As a further step in Montreal, an option has been taken on a proposed site for buildings to house all sales offices and warehouse facilities. It is hoped this can be accomplished before the end of 1951.

Amer. Cyanamid To Have New Headquarters in Chicago

Construction has begun on a 100,000 square foot building in Chicago which will be leased to American Cyanamid Co., New York. Total term rental of a long-term lease will approximate one million dollars. The Kimad Building Corp., formed by J. Emil Anderson & Co., Inc., to build and manage the building, has announced a scheduled completion date of March, 1951.

Basic construction of the building will be of brick and steel girder with face brick and Indiana limestone trim for the entire office and front of the warehouse; common brick will be used on the sides of the warehouse. The 20,000 square foot office area will be air conditioned, as will the laboratories and certain of the storage areas. The first floor of the two-story edifice will be an 80,000 square foot warehouse.

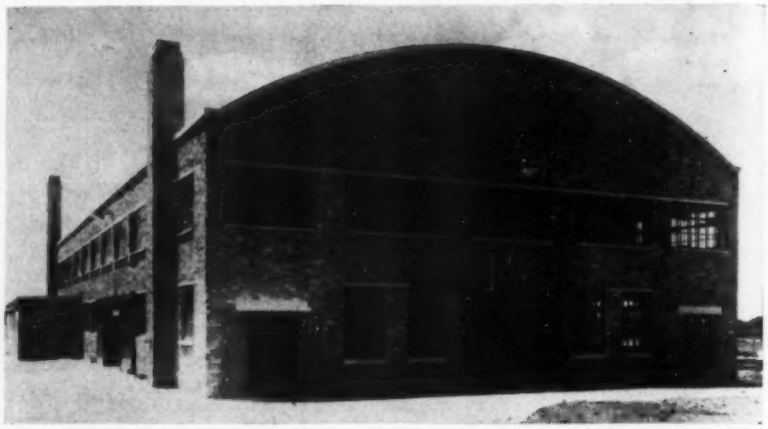
Reliance Electric now Has Canadian Subsidiary

Establishment of the Reliance Electric & Engineering (Canada) Limited, of Welland, Ont., as successor to the Commonwealth Electric Corp., Ltd., was announced December 22.

Control of this company which manufactures alternating current motors and transformers was acquired by The Reliance Electric & Engineering Co., of Cleveland, in September of this year. Transformers and a-c motors will continue to be manufactured and sold bearing the trade name Commonwealth. In addition, the plant is taking on the manufacture of three Reliance lines: (1) all-electric, adjustable-speed drives for a-c circuits; (2) engineered drives; (3) and d-c motors.

Officers of Reliance Electric & Engineering (Canada) Limited, elected at a recent board meeting are: J. W. Corey, president; J. N. Stanley and G. E. Bevis, vice presidents, and C. G. Kilty, secretary-treasurer. Mr. Corey is president of the Reliance company in Cleveland.

ADDITIONS TO THE STAFF of Bjorksten Research Laboratories, Madison, Wis., made recently include the appointments of Stephen Marshall, Robert J. Roth and Dr. Earle A. Weilmuenster. Dr. Howard Lyle Gottlieb has been appointed development chemist.



New manufacturing plant of Link-Belt Africa Limited at Springs, Transvaal, about 28 miles east of Johannesburg

New Manufacturing Plant Acquired by Link-Belt's South African Subsidiary

The wholly-owned subsidiary of Link-Belt Co., Chicago, located at Johannesburg, South Africa, has purchased a manufacturing plant, with separate office building for the purpose of manufacturing conveyor machinery and other L-B products used in Africa. This company, known as Link-Belt Africa Limited, was incorporated in January, 1950 (Cf. P.I., May, 1950).

John E. Petersen

John E. Petersen, formerly divisional engineer at the company's Pershing Road plant in Chicago, has been appointed managing director of the South Africa company. Gene Zwerner, previously L-B district sales engineer at Detroit, has been made sales manager; A. L. Endroll, who last served as district sales engineer at the company's Atlanta plant, is transferring to South Africa to supply additional manufacturing and engineering experience.

Brown Instruments Div. Acquires Property for Expanding Facilities

Industrial production and operating facilities of the Philadelphia plant of Brown Instruments Division of Minneapolis-Honeywell Regulator Co., Minneapolis, are being expanded. The firm has purchased the Thomas M. Royal plant, a three story concrete structure, as well as about 60,000 square feet of undeveloped property adjacent to it.

The Brown Division now employs about 2000 people, some 20 per cent more than were associated with the firm during the peak employment of World War II. The new expansion is being made so that facilities for even more workers, necessitated by the present emergency's mobilization program, will be available.

Two New Properties Increase Working Space for Leeds & Northrup

Acquisition of two pieces of property which together total about 85,000 square feet of working space has been announced by Leeds & Northrup Co., Philadelphia. Increased by 28 per cent, the Philadelphia facilities now total nearly 10 acres of floor space.

Some operations of the Philadelphia plant will be transferred to the new properties, but principal manufacturing and other firm activities will still be headquartered at the main plant; chief use for the new facilities will be that of delivery and service improvement.

Worthington Has New Subsidiary—Wintroath Pumps—in California

On December 19, the Wintroath Pumps, Inc., of Alhambra, Calif., became a wholly-owned subsidiary of Worthington Pump and Machinery Corp., Harrison, N.J.

The Wintroath company which was organized in 1929 will continue under the present management with Boyd Kern remaining as president.

IN A CASH TRANSACTION, Cochrane Corp., Philadelphia, has acquired virtually all the capital stock of Pottstown Metal Products Co., Pottstown, Pa. The Pottstown firm has been, since its formation in 1927, a principal Cochrane supplier; it will henceforth be operated as an independent Cochrane subsidiary.

The Paper Industry Pictured Highlights

TAPPI MEDALLIST for the year is Geo. H. Tomlinson, vice pres. of Howard Smith Paper Mills Ltd., Montreal. This, the 19th medal of the Technical Association of the Pulp and Paper Industry, will be awarded at the annual TAPPI luncheon in New York City, Feb. 22.

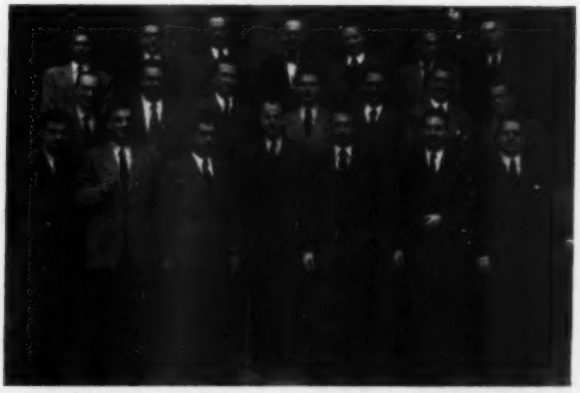
FOR OUTSTANDING WORK IN FORESTRY, four 4-H Club boys earned $300 scholarships and all-expense paid trips to Chicago. The awards, given by the AFPI were presented at the National Congress held in Chicago.

SOMETHING NEW—a telephone in the auto of L. M. Phillips, sales engineer with Rodney Hunt Machine Co., Orange, Mass., brings each customer as close to the home office as the dashboard

NEW PRESIDENT OF Paper Mill Men's Club of Southern California is Roland Wolf (R), Graham Paper Co. He succeeds Irvin E. Damon (L), of Northern Paper Mills.

TWO PROFESSORS, who participated in the first national meeting of Tree Farm sponsors' representatives, held in Washington, D. C. Prof. Emanuel Fritz (left), University of California, and Prof. W. F. Ramsdell, University of Michigan.

OLD-TIMERS shown with Marathon Corp. President, Wm. L. Keady (L to R), are: Oliver Baenke and sons John and Al. This family totals 90 years of Marathon service. At right is D. C. Everest, board chairman, who has been with the company since its inception



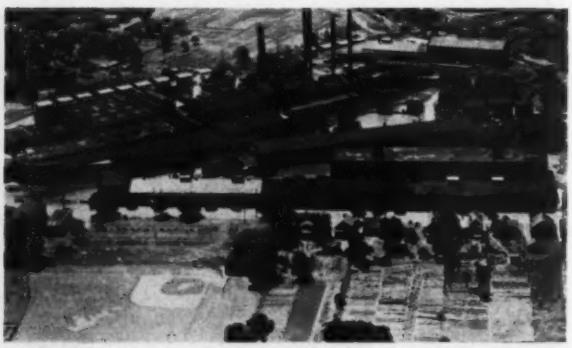
ON OBSERVATION TOUR of American papermaking and paper conversion methods, this group of French industry executives and representatives of the French Government labor administration are shown during their visit to the Sealright Co., Oswego Falls, N. Y.

Middletown Plant No. 1

In 1901 the first paperboard was manufactured at this mill, then the Colin Gardner Paper Co.

Middletown Plant No. 2 and General Office

This mill was started in 1909 but has grown continuously throughout the years



Lockland Plant

Originally owned by the Richardson Co.; merger followed by purchase made this mill a part of Gardner operations

Edward T. Gardner
President and
Gen. Mgr.

Colin Gardner
Exec. Vice Pres.
in Charge of Sales

Robt. E. Gardner
Senior Vice Pres.
Dir. Board Sales

Fifty years of progress at

▶▶▶ IN ITS FIFTIETH YEAR, the organization of The Gardner Board & Carton Co., Middletown, Ohio, paused on the threshold of its second half century to review and to reflect upon the company's growth since its founding. Ceremonies fitting this memorable year have reminded old-timers of the humble circumstances surrounding the company's early operations, and new friends have become acquainted with the history of its growth and achievements.

Gardner's Golden Jubilee became a veritable "saga of progress," which began in a small board mill producing about 10,000 tons of paperboard products annually with about 48 employees on the payroll, and has developed into a completely integrated industrial concern producing 200,000 tons of paperboard products annually and employing some 2,000 men and women.

A banquet held December 4 at Hotel Manchester, Middletown, climaxed several weeks of anniversary events which included the cornerstone laying of the company's new retail box plant at Lockland, and the presentation of an anniversary gift of fifty *silver* dollars to each of the employees.

Present at the banquet were about 600 guests including employees with 30 years or more of service; members of management; civic, industrial and community leaders of the Miami Valley.

A closely-knit relationship was strongly evidenced at the banquet. Toastmaster Colin Gardner, a son of one of the co-founders, presented a 50-year service pin to his brother, Edward T. Gardner, president, who shared with their father the founding of the company. Also honored were: Robert E. Gardner, senior vice president, director of board sales, and Walter E. Sooy, executive vice president in charge of operations.

Chairman of the Board Wellmore B. Turner, Dayton lawyer and a prominent figure in the paperboard industry, was principal speaker at the banquet. He paid tribute to the founders of the company and the other leaders who have followed them.

Prominent among those present at the banquet was Charles R. Hook, chairman of the board of The Armco Steel Corp., who announced that his firm will present the Gardner company with a large mural, etched on stainless steel, which will commemorate its progress and that of the paper industry. When finished, this mural will hang in the lobby of the Gardner offices.

Walter E. Sooy
Exec. Vice Pres.
Manufacturing

Colin Gardner III
Vice Pres.
Operations

Edw. T. Gardner, Jr.
Vice Pres.
Finance

Gardner Board and Carton

Gardner and the community

Gardner and its employees have a long record of interest and participation in the affairs of the communities in which its plants are located. Further service, focussed toward the youth of these communities, is the new Gardner Scholarship Fund, announced at the anniversary banquet.

Sixteen scholarships, each carrying a grant of five hundred dollars per year for tuition and expenses, are to be given to outstanding high school graduates in the Middletown and Lockland areas. As expressed by E. T. Gardner, Jr., the scholarship fund has a threefold purpose: "First, it expresses our appreciation to the communities where our company has its major operations; second, it furthers the American principle of opportunity for all; third, it makes a modest contribution to the cause of educational freedom, without which our American freedoms would not be long lived."

Gardner and its employees

Throughout the years, believing that loyalty works both ways, Gardner has made positive efforts to promote the welfare of its people—even in the trying days of its youth, when a "coal and grocery fund" was established to help employees through critical periods.

As early as 1914 the "Mutual Benefit Association" was organized to provide social and recreational activities in addition to financial assistance in cases of sickness or distress. In 1920, group life insurance was made available to employees, along with sickness and non-occupational accident insurance.

Then in 1949 Gardner adopted a retirement income plan for its employees. This plan is contributory, with the company putting in approximately twice as much as the employee, in addition to paying the cost of credited past service amounting to well over a million dollars. Some 99 per cent of the eligible employees now participate in this retirement plan.

Chronicle of Gardner's growth

The Gardner Board and Carton Co. has been operating for fifty years as a paper and carton manufacturing concern. Its predecessors, both in Lockland and Middletown, can date back farther in the manufacture of paper, roofing and other products; but the present corporation, a manufacturer of paperboard and folding cartons, reached its fiftieth anniversary in November, 1950.

In 1901 the first paperboard was manufactured on the 85-

The Gardner Scholarship Fund

(As outlined by E. T. Gardner, Jr. at the 50th Anniversary Celebration)

THE GARDNER SCHOLARSHIP FUND will be set up in such a way that sixteen students, eight from Middletown and eight from the Lockland-Reading and greater Cincinnati area, will receive financial aid for a college education. To start out, four students, two from the graduating class of the Middletown High School and two from the graduating classes of the greater Cincinnati area will be chosen annually as recipients of the fund. Each of these Gardner Scholars will be given $500 a year for college tuition and expenses. This will be continued through the four years of college if they maintain a position in the upper half of their class.

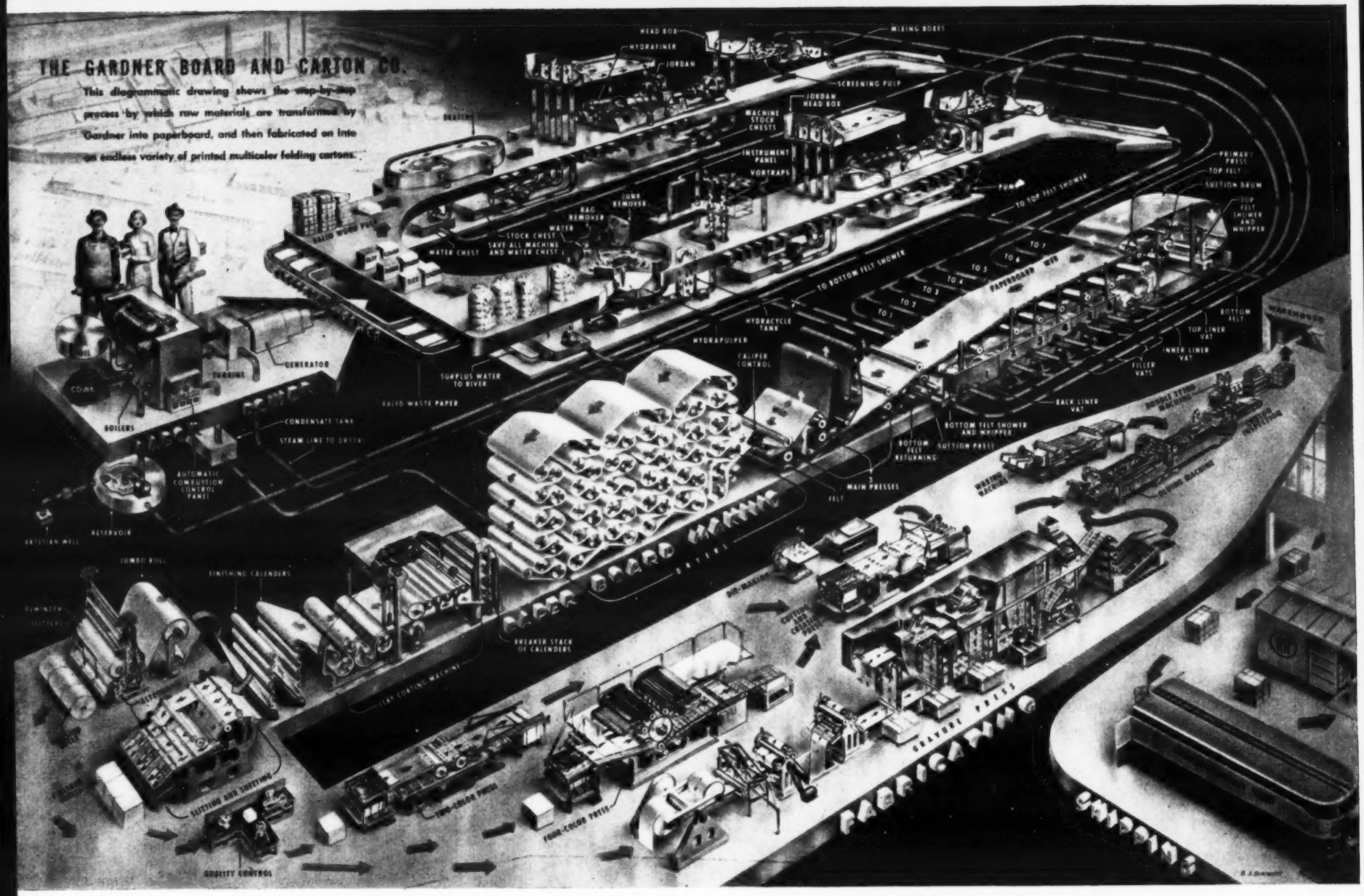
The Gardner Scholars will be chosen on a basis of character, ability, scholastic achievement, promise of future leadership and financial need, irrespective of race, creed or color. For Middletown we are going to ask the superintendent of Middletown schools, the City Manager, and a representative of the company to serve on a panel to select the scholars. For Lockland-Reading and the greater Cincinnati area we would like to have the superintendents of the Lockland and Reading schools, a representative of the Cincinnati Board of Education and a representative of the company serve on the selection panel. In this latter case a larger percentage of the scholarships will be given to students of the Lockland and Reading area where the majority of our employees have their homes.

We believe the establishment of this fund will prove to be a real service to the communities. Under its provisions individuals of outstanding ability will have an opportunity for higher education which might otherwise have been denied them. It is, we believe, a reaffirmation of the American principle of rewarding outstanding achievement. I might say that if the scholarship fund works out as well as we think it will, it may be expanded at a later date. In addition, the company will make every effort to provide summer jobs to these Gardner Scholars in order to aid them in providing for the remainder of their college expenses.

We are restricting these scholarships to a list of outstanding colleges or universities which are not dependent on federal, state or municipal funds for support, and which have an accredited four-year course leading to a Bachelor of Arts degree, a Bachelor of Science degree or both. Within these restrictions the winners of the scholarships may select any institutions they wish. We have restricted the fund in this manner not because we do not respect the many splendid tax-supported educational institutions in this country, but because the existence of many of the more than 500 private colleges and universities in the country is threatened by economic influences beyond their control—the most serious of these being the fact that they must operate on fixed incomes in a period of rapidly rising costs. Many of them are in danger of being compelled to seek government financial aid or go under.

We believe there is a place for both the tax-supported and privately supported higher educational institution and that if one of them remains free of thought control the other will also. If all institutions have to accept federal aid, and with it federal inspection, there is real danger that freedom of teaching and freedom of learning will vanish from our country. If that should happen it would be a national tragedy. In Europe, where most educational institutions are government financed and controlled, this has already happened.

Lenin, the famous communist leader, knew what he was talking about when he said, "Give me twenty years' control of the schools and I will eradicate the last vestiges of rotten pseudo-democratic liberalism." So did Hitler when he said, "With control of the police and the schools I will produce a new German nation." None of us here wants a new American nation on the Russian or German pattern.


THE GARDNER BOARD AND CARTON CO.
This diagrammatic drawing shows the step-by-step process by which raw materials are transformed by Gardner into paperboard, and then fabricated on into an endless variety of printed multicolor folding cartons.
HEAD BOX
HYDRAFINER
JORDAN
MIXING BOXES
SCREENING PULP
JORDAN HEAD BOX
MACHINE STOCK CHESTS
INSTRUMENT PANEL
VORTRAPS
PUMP
TO TOP FELT SHOWER
PRIMARY PRESS TOP FELT
SUCTION DRUM
TOP FELT SHOWER AND WHIPPER
RAG REMOVER
JUNK REMOVER
WATER
STOCK CHEST
SAVE-ALL MACHINE AND WATER CHEST
WATER CHEST
TO BOTTOM FELT SHOWER
TO 7
TO 6
TO 5
TO 4
TO 3
TO 2
TO 1
PAPERBOARD
BOTTOM FELT
TOP LINER VAT
INNER LINER VAT
FILLER VATS
BACK LINER VAT
WAREHOUSE
HYDRACYCLE TANK
HYDRAPULPER
CALIPER CONTROL
SURPLUS WATER TO RIVER
BALED WASTE PAPER
GENERATOR
TURBINE
COAL
BOILERS
CONDENSATE TANK
STEAM LINE TO DRYER
AUTOMATIC COMBUSTION CONTROL PANEL
ARTESIAN WELL
RESERVOIR
BOTTOM FELT SHOWER AND WHIPPER
BOTTOM FELT RETURNING
SUCTION PRESS
MAIN PRESSES
FELT
WATER SPRAYING
WIRE SECTION
WIRE BACKING
FELT BACKING
JUMBO ROLL
FINISHING CALENDERS
REWINDER
SLITTERS
PAPER BOARD MACHINE
DRYERS
BREAKER STACK OF CALENDERS
CLAY COATING MACHINE
PRE-HEATER
CUTTING AND CREASING PRESS
GRAVURE PRESS
FOUR-COLOR PRESS
FOUR-COLOR PRESS
SLITTING AND SHEETING
QUALITY CONTROL
FABRICATING
SHIPPING

inch machine of the Colin Gardner Paper Co. in Middletown. The founder and president of this company was sixty-year-old Colin Gardner, Sr., who had already been in the paper manufacturing business for nearly thirty years with the Tytus-Gardner Paper and Manufacturing Co. He started the new company with his son, E. T. Gardner, and the late George Harvey.

The infant company with its meager resources had to ask its first customer, The U.S. Printing and Lithographing Co., of Cincinnati, to pay for its first carload of paperboard so that the company could meet its first payroll. That is how the Gardner paperboard business began in Middletown. In 1905 a second machine was added in this mill.

In 1908 the Richardson Co., which stemmed from a straw mill built some fifty years before, alongside the old Miami & Erie Canal, started manufacturing paperboard in the present Lockland mill. At that time, this new mill was the largest and most modern board mill in the world. The two large machines gave the company a basis on which to build for many years.

In 1909 in Middletown, Mill No. 2 was built and the 124-inch machine was installed. This marked the end of the expansion of the present paperboard facilities in terms of number of machines. They are the five paperboard machines of the Gardner Board and Carton Co.

In 1913, after the disastrous flood of that year, the Richardson Co. acquired the plant and equipment of the Reynolds Paper Box Co. and thereby started what is now Gardner's carton business in Lockland. In 1923, in Middletown, after the depression of 1921, the Gardner interests purchased the Universal Paper Products Co. of Clyde, Ohio and moved it to Middletown. This is now the Middletown Carton Plant. This plant was purchased to stabilize operations in the paperboard business, which was subject to marked fluctuations.

In 1932 the Gardner interests in Middletown and the Richardson interests in Lockland were merged, and the Gardner-Richardson Co. was formed. In 1946 the Gardner interests purchased the Richardson stock, and finally in 1949 the Gardner-Richardson Co. became the Gardner Board and Carton Co.

In 1947 it became apparent that the milk bottle division of the Middletown Carton Plant was getting too big to risk further expansion without a good pulp supply.

The company, in co-operation with The Champion Paper and Fiber Co., of Hamilton, Ohio, expanded the milk carton division by setting up a new company called Dairypak, Inc., with plants in Cleveland, Ohio, and Athens, Ga. The two companies, Gardner and Champion, each own 50 per cent of this growing corporation.

In 1949 the company purchased the Bevis Machine Co. in Middletown and merged it with its own shop under the name of Manchester Machine Co., as a wholly owned subsidiary of the Gardner Board and Carton Co. This further expanded facilities for maintenance and development work. The major portion of the production of this shop is devoted to work for customers in the paper industry as well as many others.

Gardner's plant improvement program

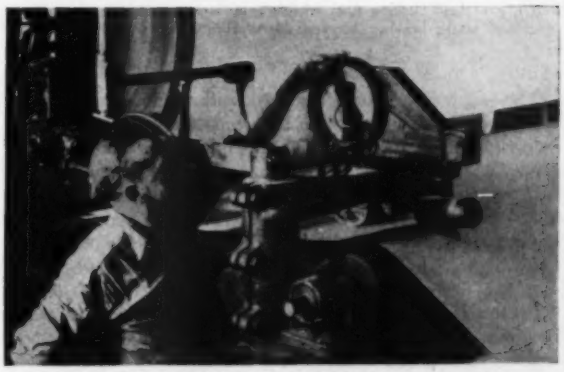
Nearly $8,000,000 has been spent on plant improvements during the last five years, and another $2,500,000 of further improvements are projected for the future. Some 90 per cent of earnings have been plowed back into the company, which, together with borrowed capital, has been used to finance this work.

At the Lockland plant

One of the major additions at Lockland is the new retail box plant, construction of which was started several weeks ago (cf. THE PAPER INDUSTRY, Nov., 1950, p. 837). Since the war, however, numerous other projects have been completed, several are under way, and many more are contemplated.

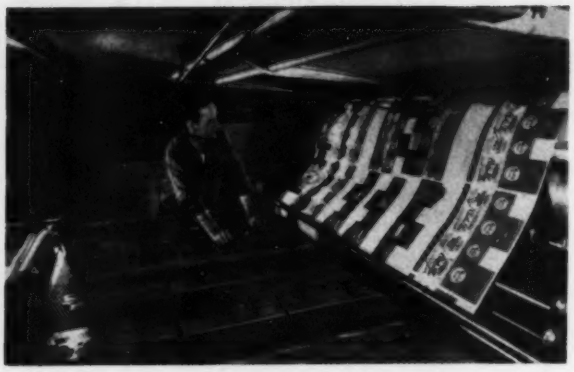
Hydrapulper with rag and junk remover is located in new stock preparation building at Mill No. 1, Middletown

These two cylinder machines at Lockland turn out over 300 tons of paperboard per day



Caliper control device developed originally by the late George Harvey, one of the company's co-founders

Machine coating of paperboard was started at Gardner in 1939—coating is applied by top roll at left



Pressman at work on make-ready on the first form of a Miehle two-color press in the Middletown plant

Automatic device (developed at Gardner) on Miehle two-color press delivers sheets on edge to prevent offsetting

Delivery end of cutting and creasing presses—strippers knock off waste leaving formed carton blanks

Sperry rotogravure press handles 72-inch diameter rolls and has an automatic butt splicer

The two board machines at Lockland are designated as No. 4 and No. 5. No. 5 machine has been completely rebuilt and a new machine coating unit added. A Stamm moisture control system was installed on this machine. A Hydrapulper, complete with rag and junk remover, was placed in service to handle filler stock. Two new Sveen-Pederson save-alls have just been put into operation for clarifying white water and recovering fiber.

A new 133-inch wide Beloit rewinder, capable of making 72-inch diam. rolls, will be installed on No. 5 and the present rewinder moved over to No. 4 machine. Greater rewinder capacity is required to supply rolls to the two new high-speed rotogravure presses. The new rewinder will be equipped with a 10-ton hydraulic lift for lowering the rewound rolls direct to the basement, from which they will be taken by fork truck to the rotogravure presses.

No. 4 machine is now being revamped. The dryers are being widened by installing sleeves on one end of each cylinder, so that they may take advantage of the full width of the wet end. A machine coating unit for this machine is also contemplated. Six new 14-plate Packer screens will be installed ahead of No. 4, and two old ones will be relocated. Eight new stainless steel mix boxes will feed the vats of the cylinder machine. A new 60-inch vat has been installed.

Sperry rotogravure presses

Two new Hydrapulpers will be installed to replace the breaker-beaters on the top liner stock preparation system on both machines. A future project is to rearrange and reorganize the stock preparation department in accordance with an overall master plan, for which a scale model has been built.

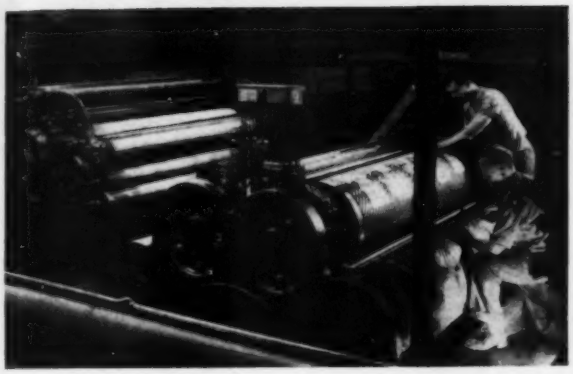
Outstanding among the many improvements in the carton plant at Lockland are two Sperry rotogravure presses which will handle the complete output of one board machine. These presses combine the three major fabricating operations—multicolor printing, cutting and creasing, and stripping. The first of these presses, a 26-inch wide unit, has been operating for some time on soap cartons, while the second one, a 40-inch unit, will be employed to make cigarette cartons. Operating at speeds up to 620 fpm, each of these two machines will handle 72-inch diam. rolls and are equipped with automatic butt splicing units which permit uninterrupted operation. The 26-inch machine has four printing cylinders, and the 40-inch machine has three.

To a great extent, the successful operation of these high-speed rotogravure presses is dependent on receiving good rolls of high-quality board from the board mill. A smooth, level sheet in hard-wound rolls is essential to get a good printing job. Soft or telescoped rolls invariably lead to trouble on the presses. Rolls are wound on 12-inch diam. lightweight steel cores at the paper machine rewinder for use on these two presses.

While a new power plant with two new boilers and a non-condensing turbine is planned for the future, a new high-voltage A-C power distribution system will be installed sometime during 1951.

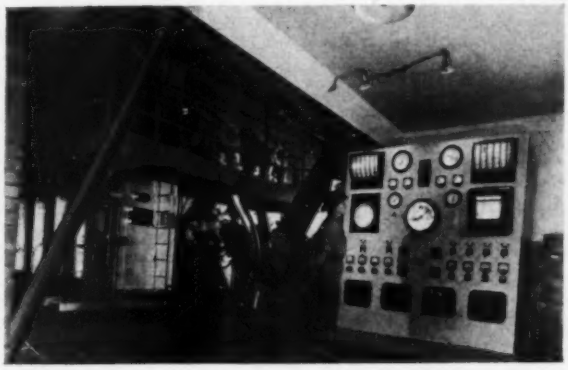
Construction planned for Lockland also includes a new employees' locker room and a new cafeteria. A new office building was put up in 1946, and numerous other building additions have been completed or are contemplated for the future.

Biggest individual improvement at Middletown was the new million-dollar power plant completed in 1949 at the No. 2 mill. This included a new boiler together with coal-

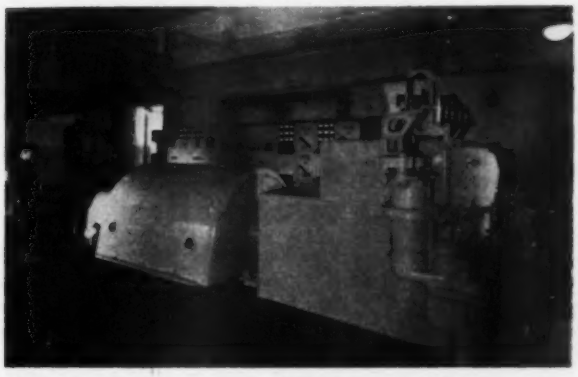


This four-color Cottrell rotary press is one of several used to turn out multicolor cartons

Battery of Miehle cylinder cutting and creasing presses. Each press is equipped with a modern automatic pile feeder



Combustion Engineering boiler with Leeds & Northrup control panel in the new million-dollar power plant at Mill No. 2



New power plant includes a G-E 4000 kw. non-condensing turbogenerator using 600 psi steam

handling equipment, ash-handling equipment, feed pumps, feedwater treatment, 4000-kw. turbine and switch gear, and a building addition to house the equipment.

Middletown power plant

The new Combustion 2-drum type VU boiler has a capacity of 110,000 lb. of steam per hour at 625 psi and 725 F. total temperature. Firing is by pulverized coal utilizing four burners, which are also adaptable for oil or a combination of oil and coal. No economizer is used, heat recovery being accomplished through an air preheater which delivers air at 525 F. and reduces the outgoing gas temperature to approximately 350 F. Over-all efficiency design is 85.9 per cent.

The feedwater is treated in a two-stage Cochrane hot process system after preheating by a heat exchanger making use of the waste heat from a continuous blowdown system. Deaeration of returned condensate is also accomplished in the same unit.

Coal from yard storage or a car shakeout is delivered by a skip hoist to a 200-ton overhead cylindrical bunker from which it flows through an automatic coal scale to the coal feeders on the firing floor and to the Raymond pulverizers located in the basement.

Ash from the new boiler dry bottom, from the soot hoppers, and from the fly ash precipitator is handled by a Nuveyor system and accumulated in a tile silo for disposal. This ash handling system was also extended to the older plant, which now serves only as stand-by equipment.

Automatic combustion control is accomplished by Leeds & Northrup equipment, which also permits manual operation by pushbutton control of the individual dampers and coal feeder rates. Induced fan speed is automatically adjusted through a hydraulic coupling to maintain the most economical speed. On the control board all damper positions and coal feeder rates are indicated. Gas temperatures are recorded, as are steam flows, steam pressure, air flows and CO_2. The controls for auxiliary motors are interlocked to provide for sequential starting.

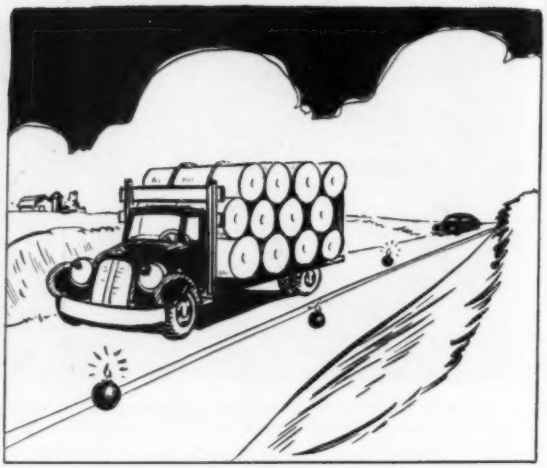
The power plant improvement also included installation of a G-E 4000 kw. non-condensing turbo-generator for throttle steam at 600 psi and back pressures as determined by process steam requirements. The original 2000 kw. extraction turbo-generator was altered to permit mixed pressure operation in parallel with the new 4000 kw. machine when desired. When operating with only the non-condensing turbine, additional steam for process make-up is obtained through a reducing-desuperheating station from the 600 lb. line.

The new boiler replaces four Stirling type stoker fired boilers generating steam at 200 psi. This older plant is being overhauled and will be retained as stand-by equipment.

To accommodate these recent additions, a new building was erected adjoining the power plant. The addition is 58 ft. long, 46 ft. wide and 58 ft. high from grade to roof line. An 18-ft. basement provides ample space for location of the pulverizers below the firing floor level.

Other Middletown improvements

Except for the power plant, major improvements at Mill No. 2 were in the carton department. A number of new machines have been installed during the last few years, among them several new Staude gluing machines, a new cellophane winder, etc. At Mill No. 1 a new Hydrapulper building was put up in 1949. New locker-room facilities are now being built at Mill No. 2.



Owner or Driver . . .
which is liable in motor truck accidents?

LEO T. PARKER
Attorney at Law

▶▶▶ WHILE ON A TOUR of 22 states, the author visited a number of papermaking plants. One of the executives contacted asked this legal question:

"For many years I have read with a great deal of interest your legal writings in THE PAPER INDUSTRY. One important subject which you have not covered is how we can avoid liability for injuries caused by motor truck drivers. This is an important legal subject because all paper and pulp producing companies utilize motor trucks extensively, not only in transportation of paper products, but also for hauling logs, chemicals, and other supplies to the plants. What legal rules do you have that will assist us to educate drivers to avoid damage liabilities"?

For the benefit of this reader, and others, the author made a special review of outstanding motor truck lawsuits from which to formulate legal rules that should reduce damage liability from this source.

First, it is important to know that the courts have consistently held that paper companies are not liable for injuries caused by a motor vehicle being operated at the time of injury by an independent contractor. Also, a paper company is not liable for injuries effected by a regular driver who causes an injury when acting outside the scope of his employment or authority, as where he deviates from a regular route, or uses the vehicle for his own pleasure or purpose.

And again, the higher courts have consistently held that if the driver of a motor vehicle signs a contract in which it is agreed that he will not permit strangers to ride on the truck, or permit any person to drive the truck and, further, that he will use care when driving the truck, the company may avoid liability for injuries resulting from failure of the employee to comply with the terms of the contract.

A careful review of recent higher court cases indicates that the chances of liability may be importantly reduced if paper company officials have motor truck drivers sign a contract containing a clause as follows:

"I, the undersigned, being employed by *(name of company)*, hereby agree that I will not allow anyone to ride on the truck which I am employed to operate, other than authorized helpers. Also, I will abide by laws and ordinances, and will not use the truck for my own purpose or pleasure. *(Driver signature.)*"

If a truck driver disobeys these instructions the company ordinarily is not liable for injuries. This is so because a majority of courts hold that where the driver of a motor vehicle disobeys instructions, the company is not liable because then the employee acts outside the scope of his known authority. See White, 165 Ala., 230.

Instructions for drivers

It is advisable to include in contracts of employment specific instructions to drivers as shown by the 22 rules tabulated in the accompanying table. Strict adherence to these rules will minimize the driver's personal liability as well as that of his employer. Observance of such rules will greatly reduce chances of lawsuits.

Personal liability of truck drivers

Since all employees are personally liable in damages to persons injured through their own negligence, truck drivers who know that this law exists will use greater care when driving their employers' vehicles.

See Moser v. Interurban Co., 62 N.E.

Rules for Truck Drivers

Always be careful
Slow moving vehicles keep to extreme right side of street
Don't pass another vehicle at a curve
Don't speed for intersections or lights
Don't park disabled vehicle on highway
Don't use glare or blinding headlights
Always keep vehicle under control
If a child appears near curb, slow down
If foggy or slippery be ready to make emergency stop
Don't speed up when another vehicle attempts to pass you
Keep in proper driving lanes
Don't permit your lights and brakes to become defective
Always look before backing up
Use care when passing through signal lights
Signal and look both ways before making a turn
Discard worn tires
Don't pick up strangers
Move to extreme right when driver in rear blows his horn
Don't zig-zag when passing another car
Pull to curb when fire department or other emergency vehicle approaches
Always park close to curb
Be careful, although another driver is violating a traffic regulation

(2d) 558. It was shown that a boy 12 years old was injured by a negligent truck driver. The boy was in the hospital over two months, and he sued both the driver and his employer for damages. The higher court held the truck driver personally liable in $8500, although he contended that he should not be held personally liable since he was an employee and did not own the truck.

Very frequently a negligent truck driver may be liable indirectly for severe damages in addition directly to ordinary damages. In other words, a negligent driver is liable for all injuries both directly and indirectly caused by his negligence.

Unique truck accident

For example, in Gunter v. Fisher, 41 So. (2d) 692, it was shown that an employee was driving a pulpwood truck at night time when he encountered some mechanical difficulty in the operation of the motor. He brought the truck to a stop on the right hand side of the paved portion of the highway. While the employee was attempting to start the truck or to push the same off of the highway, a car driven by Gunter collided violently with the rear of the truck. The violence of the collision, which practically demolished the front portion of the Gunter car, jammed the doors in such a manner that Gunter was imprisoned in the car. One Lynch, whose home was located nearby, rushed to the scene of the accident. The Gunter car had caught fire and Lynch immediately attempted, by raising the hood and tearing loose the ignition wiring, to avert the burning of the car and its occupants. Gunter became excited and picked up a pistol from his automobile and shot Lynch.

In subsequent litigation the higher court awarded Lynch $2735 damages, and in addition held Gunter entitled to recover heavy damages.

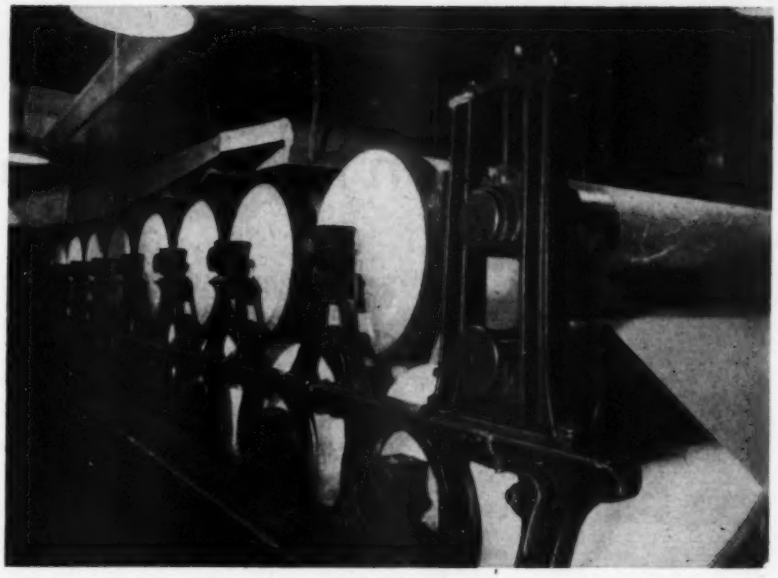
The higher court explained that these damage allowances could have been avoided had the truck driver used reasonable care and flagged down Gunter's car, or placed flares on the highway to warn approaching drivers of the danger.

For comparison, see Green, 48 Atl. (2d) 390. This court awarded a husband and wife $85,000 for injuries caused by a negligent driver.

Joint responsibility

Under all ordinary circumstances the paper company or employer of a negligent vehicle driver is liable in damages for injuries caused by the driver. The fact that the driver also is personally liable does not in the least offer any obstruction to the injured person suing and recovering damages from the employer *unless* the employer proves either of these facts: The truck driver was using the truck for his own purposes or pleasure when the accident occurred. The truck driver was acting outside the scope of the employment when the accident occured. If the paper company or other employer fails to prove that one of these facts is true, then the employer and also the truck driver are liable.

Quite obviously, the injured person generally decides to sue the paper company, although he may sue the driver personally and solely. However, this latter situation is unusual because the driver may not be personally responsible from a financial standpoint, and hence if the injured person confines the suit solely to the driver he may not collect allowable damages. On the other hand, if the injured person sues both the driver and the employer, he may collect from both or the employer solely, if suit is decided in his favor, as holding the driver and the employer jointly liable. Of course, if the driver is financially responsible he may be compelled to pay his share of the damage allowance.



Standard Asbestos Mfg. Co. applied mineral wool cement to the ends of its dryers because . . .

Insulating dryer roll ends saves steam

▶▶▶ APPLICATION OF two inch thick mineral wool cement on the ends of cylindrical paper-drying rollers at the Standard Asbestos Mfg. Co., Chicago, may suggest similar cost cutting possibilities to plant engineers, operating supervisors and power superintendents in their own plants.

Ends of the 300 F. steam heated rollers in the photograph were insulated as a result of an investigation conducted to determine ways in which steam costs could be further reduced. Although operation of the drying equipment is possible without insulation, it was recognized that bare metal dryer ends are sources of considerable heat loss. Each end of each cylindrical dryer, three feet in diameter, contains over seven square feet of area, so more than 15 square feet per dryer are now profitably insulated.

More than 90 per cent of the potential bare surface heat radiation from these roller ends is being saved by too inches of mineral wool insulating cement, applied in three layers. Before troweling on the first layer, the metal surface was cleaned to insure a good surface for adhesion of the cement. Each subsequent layer was applied after the previous layer had completely dried. Insulating coats on the ends of the dryers were beveled at the circumference and two coats of aluminum paint brushed on to provide a clean, smooth appearance. As the insulating cylinders rotate, the only bare radiating surfaces are now those that come into actual contact with the paper.

Plant management certainly does not begrudge necessary power or fuel costs for efficiently operated high temperature equipment, but too often heat waste has an unwelcome share in these costs. Properly applied thermal insulation is designed to cut heat loss on high temperature equipment wherever applied—including heated surfaces that are sometimes entirely overlooked or merely disregarded as possible trouble spots.

Do's and don'ts of packing practice

One of the well-known "peddlers" to the paper industry in both the U. S. and Canada, "Bumps" Hemphill has presented the Johns-Manville *Packing Clinic* before production and maintenance men of numerous pulp and paper manufacturers. He also has lectured on the subject at the University of Maine and before the Michigan Division of the Superintendents Association. This article, taken from Mr. Hemphill's *Packing Clinic* notes, will be welcomed particularly by readers who have followed the Karassik-Carter articles on centrifugal pumps that have been appearing from time to time in *The Paper Industry*.

J. W. HEMPHILL
Johns-Manville Sales Corp.

▶▶▶ COST OF PACKING in most paper mills is a relatively small item when compared with overall purchases. The economy involved in establishing good packing procedure is not in the price of the packing, but in the reduction of wear and tear on equipment such as sleeves, rods, etc., reduced shutdown time resulting in more production, and finally less work for maintenance crews. A good packing procedure is a definite part of a modern preventive maintenance program.

It is estimated that anywhere from 18 to 24 per cent of the total power used in a paper or pulp mill is required to pump stock, slurries, white water, and other fluids through the various processes. Any savings in power that can be accomplished through the proper handling of packings represent cost reduction. Fundamentally, every stuffing box should be looked upon as an energy absorbing unit, and every stuffing box should be operated so that this power loss is reduced to an absolute minimum.

All packing manufacturers use the same basic materials in the manufacture of packings. Packings are made from asbestos, flax, cottons and various metals, etc., incorporated with graphite and lubrications of various kinds to suit specific conditions. Practically all manufacturers make similar lines of packings. While the selection of a proper packing for industrial application is very important and may increase service life considerably, the proper handling of a packing will increase its service life many fold. If we were to evaluate factors that determine the service life of a packing installation, about 25 per cent of the service life is built into the packing itself and 75 per cent depends on how the packing is installed and handled.

Long service life cannot be expected from equipment that is in poor mechanical condition. Scored sleeves and rods, loose bearings and rods or shafts out of alignment are bound to cause excessive wear and leakage and early packing failure. Fundamentally, packings are designed to prevent excessive leakage and to this extent are really a substitute for close machining. They are not intended to serve as bearings.

Fundamentals of packing practice

All stuffing boxes on rotating or centrifugal shafts, regardless of service, should be equipped with lantern rings (seal cages) and sealed with an expendable fluid or semi-fluid such as water, steam or grease. We suggest a combination of water and grease so arranged that the grease is fed onto the rotating pump shaft by the pressure of the water, which should be higher than the discharge pressure of the pump.

In most cases it is good practice to pack with the greater number of packing rings between the lantern ring and the bottom of the box. For example, if there are five rings of packings and lantern ring, it is generally good practice to use three packing rings between the lantern and the bottom of the box and two rings between the gland follower and the lantern. If the packing has been correctly installed, a pressure seal is established in the bottom of the stuffing box that prevents the fluids and solids being pumped from entering the stuffing box. Since controlled leakage is necessary for the carrying away of heat generated by friction, the path of least resistance is out toward the gland follower.

We recognize that operations may at times suggest different packing arrangements to meet certain specific conditions; however, by the arrangement of packings as suggested above, it can be readily seen that the expendable medium seals the materials being pumped and the packing in turn controls the leakage of the expendable medium. Under such conditions of operations, maximum life of packing, minimum waste of power through friction and minimum wear and tear on rotating parts are obtained. Maintenance of equipment is reduced and longer operating cycles without major repairs are certain.

There is a correct method of packing a stuffing box. It would hardly seem necessary to spend any time discussing the packing of a stuffing box and yet it can be stated without fear of contradiction that very few stuffing boxes are properly packed. It is very difficult to build any romance into installing a set of packing. It is generally a dirty, hot, uncomfortable job that most mechanics try to complete with the least possible effort and in the least possible time. However, the proper installing of packing is the first and one of the most important steps in the handling of packings.

How to pack a stuffing box

Remove all the old packing and thoroughly clean the stuffing box. Check water lubrication inlets and connecting piping to be sure they are not plugged and are free from obstructions. Apply a liberal coating of cup grease or heavy oil or other permissible lubricant to the inside of the stuffing box. This procedure assists in seating the rings in the stuffing box.

Use the correct size of packing. Cut each ring over the rod or mandrel of the same size. Never spiral a packing into a stuffing box in one piece. In cutting rings from soft packings, you may find it advantageous to use a piece of black tape around the packing at the point where it is to be cut. This will permit the cut to be clean and square and prevent ravel-

ing and crushing. The tape should be renewed when installing the packing. Experience indicates that a plain butt joint is as satisfactory as step or scive joints.

When installing a ring of packing, gently form the ring around the shaft, entering the joint or cut ends in the box first. Then push the ring home, keeping the packing square with the shaft. Seat each ring individually in the stuffing box. A split bushing of proper length that can be placed over the shaft between the shaft and the inside of the stuffing box makes a handy tool for seating rings.

Tamping tools with flexible shafts (such as manufactured by the Duro-metallic Corp.) are helpful in seating the bottom rings in a stuffing box. Where working space is limited and proper seating of packing is difficult, the use of split lantern and gland followers are recommended as they can be removed entirely, thereby providing more working space. Split glands are a desirable refinement of construction on short coupled pumps particularly.

Never fill a box with packing rings and then try to seat them with the gland follower. The two top rings will be damaged and the bottom rings will not have been seated. Stagger all joints in the packing rings either 120 degrees or 180 degrees apart, depending upon the number of rings in the box. Lantern rings should be properly registered under the sealing inlet port in such a manner that when it is advanced in the box by the taking up of the packing, it will not obstruct the inlet port and cut off the sealing fluid (see Figure 1).

Adjusting the stuffing box

After taking up the last rings with the gland follower, slacken off on the stud nuts and bring them up just finger tight. If possible, turn the unit over by hand to be sure the packing is not binding. Allow excessive leakage during the first few hours of running in. If heating occurs, or there is a stoppage of leakage, back off the nuts further to encourage leakage and allow for expansion.

After the initial breaking-in period, the packing may then be taken up slowly. Adjustments should be made at about fifteen minute intervals until the packing is operating satisfactorily. During operating life, frequent small adjustments should be made to correct leakage rather than to permit excessive leakage over an extended period of time and then taking up the packing all at one time.

Some leakage of the sealing medium is necessary. Sealing pressure should be from five to ten pounds above the pump pressure. Where it is possible to do so, fresh, clean water should be used for sealing. To hold stuffing box temperatures and friction loads to a minimum, some leakage of fluid must be permitted.

A well lubricated set of packing will develop little friction, and cause only a fraction of the energy loss involved where packing runs on a dry shaft. Stopping all leakage results in seizure, overheating, increased power consumption, and ultimate destruction of packing, or sleeve, or shafts, or both.

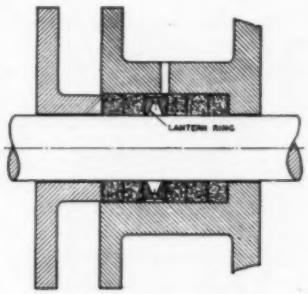


FIG. 1 – LOCATION OF LANTERN RING IN NEWLY PACKED STUFFING BOX

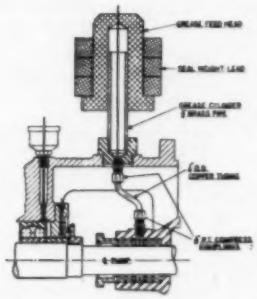


FIG. 2 – WORTHINGTON WEIGHT-LOADED GREASE SEALER

Laboratory tests show that when using a heat resisting packing such as asbestos, a leakage of at least one drop per second is required when operating at 25 psi and 1800 rpm. Investigations indicate that the life of packing is directly proportional to the increase either in pressure or speed.

Don't add new packing to old. Only in the case of an emergency should new packing rings be added to old packings in a stuffing box. The further consolidation of the old rings in the box results in establishing of high friction and scoring conditions that can readily destroy an expensive sleeve or shaft and make future satisfactory packing operations impossible. Very often considerable delay is encountered when it finally becomes necessary to remove the old packing due to difficulty in digging the consolidated material out of the box.

"P.V." values as a yardstick

Pressure-velocity factor, or "P.V." is a value obtained by multiplying the fluid pressure in psi by the surface velocity in fpm. "P.V." is a measure of generated heat if the coefficient of friction is neglected. Example: Centrifugal pump with a two-inch shaft or sleeve, operating at 1800 rpm and 25 psi—(2 x 3.1416 x 1800 x 25)/12 23,550 "P.V." values.

A similar pump operating at 3600 rpm would have a "P.V." value of 47,000; a pump having a four-inch diameter sleeve shaft, operating at 1800 x rpm at 50 psi would have a "P.V." value of 95,000.

"P.V." values are a yardstick of the work done under definite service conditions. All else being equal, the higher the "P.V." value, the more difficult the packing job. "P.V." values showing approximate relative leakage required with different types of packings for satisfactory service life are shown in the accompanying tabulation.

Lubricating the stuffing box

No packing manufacturer can put into a piece of packing a sufficient amount of lubrication to last the normal packing life and maintain a low friction loss in operation.

The use of a grease connection to the lantern and a grease gun as a means of forcing grease into the stuffing box is not generally recommended. While high pressure can be developed with a grease gun, the pressure begins to drop almost immediately and in a short time is ineffective since there is no following pressure to keep feeding lubrication to the packing. The same general objection to the use of pressure grease cups can be registered.

The Worthington weight loaded sealer is shown in Figure 2. This is a practical unit that can be loaded so as to deliver lubrication at a constant and predetermined pressure. It has the additional advantage that it can be located off the pump if necessary.

Figure 3 is a rather unique arrangement which permits the use of the seal-

Types of Packing for Different "P.V." Values

"P.V." Level	Type of Packing Recommended	Leakage
20,000 and up	Asbestos yarn	Slow drip
20,000 and up	Flax or ramie yarn	Slow drip
50,000 and up	Asbestos yarn	2 to 4 drops/sec.
100,000 and up	Asbestos yarn	4 to 8 " "
100,000 and up	Plastic packings	4 to 8 " "
200,000 and up	Plastic packings	10 to 15 " "

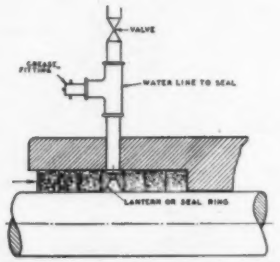


FIG. 3 — SUGGESTED ARRANGEMENT FOR LUBRICATING WATER SEALED STUFFING BOXES

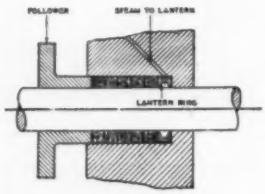


FIG. 4 — SUGGESTED ARRANGEMENT FOR INTRODUCING STEAM TO STUFFING BOX PACKING AGAINST BLACK LIQUOR

ing water pressure to force the lubrication into the stuffing box. The arrangement offers the double protection in that if the grease supply runs out the water takes over and provides some lubrication. However, experience indicates that refilling the system with grease once every eight hours will provide ample lubrication. Soap base greases are recommended as they are water soluble and will not plug the system. Lime base greases might form metallic soaps that could cause trouble.

When is packing worn out? Packing should be removed from the stuffing box when the take-up of the gland follower is such that the volume of packing in the stuffing box is reduced to two-thirds of its original volume. At this point the packing is no longer capable of feeding lubrication to the shaft.

Packing friction

In discussing friction of packing, we should consider a stuffing box as a low friction brake. Since you are mostly interested in the packing of centrifugal pumps and other relatively high-speed rotary units, the friction data follows closely that obtained in testing a brake mechanism. Coefficient of friction of a new, well lubricated packing is approximately 0.015. A worn and thoroughly carbonized piece of packing may show a friction coefficient as high as 0.40. This is an increase in friction of some 30 times. Since power consumption is directly proportional to the coefficient of friction, it is readily understandable why it is necessary to keep the friction of a stuffing box as low as possible.

Examine worn packings removed from service. We definitely recommend the examination of worn packings removed from the stuffing box. A careful study of the worn packing will give many answers to questions that you have often asked yourself regarding packing service. It may show incipient mechanical difficulties with equipment that can be corrected before serious breakdowns occur, wrong packing procedures, etc. We are listing below a few of the facts that an examination of worn packings can uncover:

Cross-section of packing reduced on one side indicates loose or worn bearings, showing tendency of shaft to climb and whip.

One or more rings missing—stuffing box bushing badly worn. It should be replaced.

Bulge in side of one or more rings—adjacent rings cut too short or have shrunk, permitting extrusion into open space.

Wear on outside diameter—rings rotating with rod—too loose—frozen to shaft.

Rings next to gland follower badly worn, bottom rings good condition—improper installation and likely too much taking up of the packing at one time.

Packing sheeting out between gland follower and rod—too much clearance between gland and rod.

Wearing face of packing glazed and charred—too much heat—high friction—lack of lubrication.

Packing badly amalgamated and consolidated—usually in too long.

Packing flanged surfaces

The careful packing of flanged and other parallel surfaces is particularly important from a standpoint of preventing delays and production stoppage The following notes may prove helpful:

Carefully clean rust and dirt from flanged surfaces, using a wire brush or sandpaper.

Be sure that mating flanges are carefully lined up. No gasket material is sufficiently compressible to compensate for flanges out of parallel.

Generally speaking, where soft sheet packings are used, it is not advisable to use tooled flanged faces. Where tooled surfaces are used, the depth of the tooling should be less than half of the thickness of the sheet packing used. In all cases, the tooling should be in the form of concentric circles and not a continuous spiral tooling, which might provide a path for leakage.

The rougher the flange surface, the harder and thinner the gasketing material: the higher will be the contact pressure necessary to prevent leakage. For example, rubber sheet packings require less contact pressure to seal than do asbestos compound sheets, and they in turn require much lower contact pressure than do metal gaskets to prevent leakage. However, in any case, the required bolt pressure is always greater than the line pressure and, as in the case of the metallic gaskets, may be several times the line pressure.

Providing the flanges are smooth and in good alignment, the thinner the gasket material used the better.

Where flanges are heavy enough to prevent distortion caused by bolt pressure, ring gaskets are preferred to full-faced gaskets due to greater ease of obtaining uniformity of pressure distribution around the gaskets.

Where the flanges are cast from acid resisting metal (high silicon iron such as Duriron) we suggest the use of full-face gaskets to relieve the strain on the metal and consequent possibility of breaking the flanges when taking up on the bolts.

The following up of the flange bolts some 12 to 24 hours after a gasket is installed is a good practice since the pressure has then had time to adjust itself over the area between bolts, causing a reduction in the overall unit pressure.

When packing flanged surfaces against light gases such as natural gas, etc., the use of all-compound sheets is suggested since there is likely to be a slow leakage through the sheet of asbestos or cloth compounded sheets. This condition might become dangerous where a piece of equipment is in a confined space and the gases could accumulate in unstable concentrations or form explosive mixtures.

Never use oil or grease on rubber or rubber compounded gaskets as they will soften and disintegrate the compound. Hard setting gasketing dopes are not recommended because of the difficulty of removing when repacking. Where the use of gasketing compounds is indicated, graphite and glycerine or graphite with molasses and water compounds are suggested as these mixtures do not set up hard and under heat will carbonize and break away with a clean surface when the flanges are taken apart. They have no disintegrating effect on the gasket material.

Never use a gasket dope on both sides of a gasket—it may cause slippage or blowout. The use of a dope on one side of a gasket will tend to provide more rapid distribution of contact pressure over the gasket area than can normally be obtained with a dry gasket, thus avoiding a gasket failure before the

gasket has an opportunity to seat itself. Furthermore, it has been observed that a lower contact pressure ratio can be used with equally good results.

Boiler gaskets

Boiler manhole and handhole gaskets of the Kearsarge type should be a close fit on cover plates. Due to the fact that this type of gasket is made from a treated asbestos cloth cut on the bias, it is possible to stretch or shrink them so as to secure a snug fit on the cover plates.

To stretch a gasket, simply place the gasket on a flat surface, holding it down at one spot with the heel of the left hand, and grasping the gasket with the right hand close up to the left hand, pull the gasket with a semi-rotating motion. This keeps the gasket in shape and at the same time stretches it. Continue this action around the periphery of the gasket by simply changing position of the hands after each pull.

To shrink a gasket, take the same holds as described above, and instead of pulling, push the gasket toward the left hand, maintaining the same semi-rotating motion to retain the general curvature of the gasket. By this method an 11 x 15-inch boiler manhole gasket can be stretched about an inch on either or both diameters.

Service conditions

The pulp and paper industry is rather unique insofar that all the process service conditions are primarily the handling of acqueous solutions, varying from clear water to those carrying chemicals, either in solution or in suspension, with or without pulp fibers of various kinds, and with or without suitable fillers and other furnish in suspension.

The *p*H range varies from 1.5 on the acid side to 14 on the alkaline side. Density range is anywhere from a consistency of ¼ per cent of air-dried pulp to solutions containing 60 to 65 per cent solids, as concentrated black liquor. Temperatures are usually under 350 F., and pressures generally under 100 psi, except in the isolated case of hydraulic lines on pulpwood grinders, balers, etc.

Boiler and powerhouse installations are typical and follow standard specifications used in central power station operations.

General recommendations

Since we are primarily interested in packings for stuffing boxes on rotating shafts, we shall confine our discussion to those styles that experience indicates to be most suitable. The packings most commonly used are the yarn type which are made into packings by either plaiting or braiding the yarns to form the base structure and then impregnating these structures with suitable forms of lubricants or synthetics to meet the service conditions. There are several forms of braided structures, the best of which is the interlocked braid, since this construction forms a continuous tied together block which does not unravel or come apart due to wear. The second type of packings that we have used to a considerably lesser extent, but which certainly merits more attention, are the extruded plastic packings.

For stuffing boxes having relatively low energy characteristics ("P. V." values), the plaited or braided packings perform satisfactorily. However, where high speeds and high pressures are encountered with high energy ratings in the stuffing boxes, the plastic packings, correctly installed and handled, will give the most satisfactory service. Possibly the best reasons why plastic packings have not been so uniformly accepted are because plastic packings require a somewhat different handling technique than do the more rugged yarn types. By close co-operation between the manufacturer and the user, these conditions can be corrected.

(a) When ordering spiral plastic packings, specify approximately shaft diameters so that spirals may be formed to near correct diameters. This will avoid excessive distortion of rings cut from the spirals. For example, a packing formed to a 3-inch I. D. spiral could be used with minimum distortion on shafts from 2 to 4 inches in diameter.

(b) Use tight square butt joints—do not allow for expansion.

(c) When placing rings over shafts, open them sideways to get them over the rod. Never spring them over the shaft or sleeve.

(d) If ring shows cracks due to handling, install it anyway, as these cracks will heal.

(e) If packing has become hard and non-conformable without breaking, oxidation has taken place and the packing should not be used.

(f) Packing should not be kept in stock longer than three months. It should be kept in a cool place away from heat.

(g) Plastic packings, due to plastic flow under pressure, may have a tendency to extrude out through the stuffing box bushing or between the gland follower and the rod if these clearances are not kept reasonably close. This may necessitate end rings of a less conformable packing such as the flexible semi-metallic types.

It should be the aim of both the manufacturer and the user of packings to keep the number of packings to an absolute minimum. Reduction in inventory, less waste and less opportunity for error follows such a procedure.

Forest Fire Damage High In 1950

ACREAGE BURNED by fires in national forests during the first nine months of 1950 was nearly double that of the same period in 1949, according to Carl A. Gustafson, chief of fire control, Forest Service, U.S.D.A. He also reported that a smaller number of fires caused greater loss in acres last year than the average loss for the last five years.

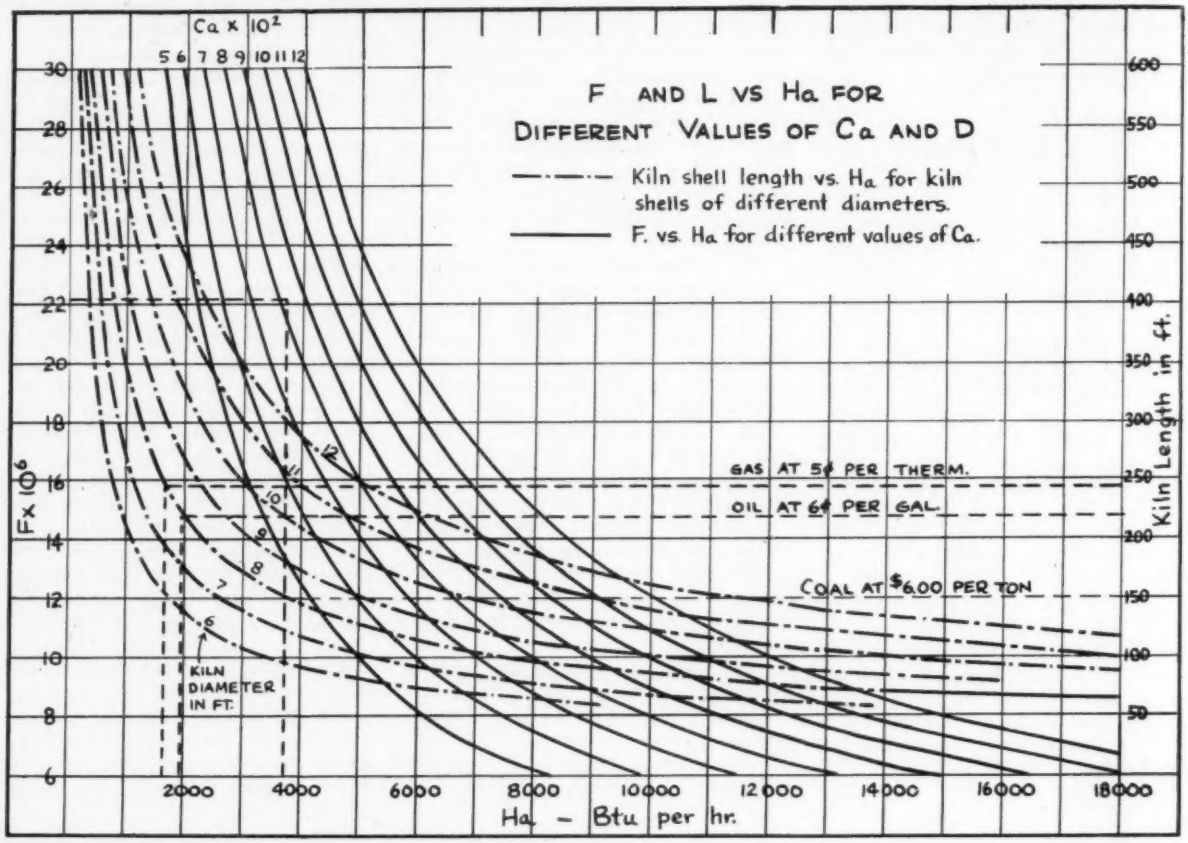
Greatest increase was in California, which had its most severe fire season in 25 years. Acres burned totaled 225,498, out of a national total loss of 324,414 acres. Other southwestern states also experienced one of their worst spring fire seasons. In Arizona and New Mexico, the number of acres burned rose from 3263 in 1949 to 32,203 in 1950.

Rocky Mountain and Pacific Northwest states, on the other hand, reported exceptionally light fire seasons. In the Intermountain Region, made up of Utah, Nevada, southern Idaho and western Wyoming, 557 fires burned 7505 acres, whereas 853 fires burned 49,937 acres a year ago. The Northern Region, which includes Montana, northern Idaho, northeastern Washington and northwestern South Dakota, this year reported 645 fires with a loss of only 298 acres, as compared with 1584 fires and 7886 acres burned in 1949. The big timber producing forests of Washington and Oregon reported that acreage burned was more than halved, dropping from 15,464 in 1949 to 6491 in 1950.

The 14 northeastern states from Maine to Kentucky reported that burning conditions in the Middle Atlantic states last spring were the worst ever recorded. Forest fires totaled 122; acreage burned was 2371, as compared to 2047 for 1949.

Eleven states south of Virginia had the largest number of fires in the country—1939 in all—and yet show a drop in acres burned from their five-year average. This is due, it is believed, to a growing use of mechanized fire fighting equipment.

Colorado, Wyoming, South Dakota, Nebraska and Kansas showed an increase over 1949 of about 23 per cent in number of fires but a 55 per cent reduction in area burned. The North Central Region, made up of Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, North Dakota, Iowa, and Missouri, reported a large drop, from 833 fires in 1949 to 533 in 1950, with acreage burned dropping from 11,191 to 4454.



How to determine the economical length of the rotary kiln

To our readers who have been following this series of articles it may seem that the author has taken a long time and a round-about way to arrive at the objective of his search—a method for determining the economical length of the rotary kiln. . . . With this article, however, that part of the study has been reached.

RALPH E. GIBBS*
Consulting Chemical Engineer

▶▶▶ THE BEST MANNER OF analyzing the problem of fixing the economical length of the rotary lime kiln probably is to base the computations either on the lineal feet of kiln shell, or on the square feel equivalent of kiln shell surface. For our present purpose, the latter course will be used.

It will be impossible for the author to use exact cost figures, since these are not available, nor are there any figures that are completely applicable to all cases. Also, it will not be possible to satisfy all the prevailing ideas of the accounting methods that are possible. All that can be attempted at this time is to develop a method which will be applicable generally. Then the individual cases can be studied by using the data prevailing, and applying it to a solution of this intricate problem.

In a previous article the author developed some empirical relations for the rates of heat transfer from the gases to the charge in the kiln in the different zones. Among them was that for determining H_a, the Btu per hour transferred from the gases to each square foot equivalent of kiln shell surface in any zone of the kiln beyond the flame zone. This relation is $H_a = [0.159D(572+1.95L)(L_n+L_{n-a})(4700+1550D)(L_n - L_{n-a})D\ .27]/[L(L_n - L_{n-a})(L_n)(L_{n-a})]$, wherein D is the kiln shell diameter in feet; L is the kiln shell length in feet; L_n is any lineal kiln shell length, generally less than L; and L_{n-a} is any lineal kiln shell length less than L_n. All values of L, L_n, and L_{n-a} are measured from the product discharge end of the kiln.

By using this relation, which enables us to compute the heat transferred from the gases to each square foot-equivalent of kiln shell surface, it will be possible for us to determine the fuel cost equivalent of this heat.

When the value of the heat transferred to some specific surface is greater than the cost of providing and maintaining that surface, then the cost of the surface is economically justified. When the value of the heat transferred to a specific surface is less than the cost of providing and maintaining that surface, then that surface is not economically justified.

Thus we are seeking $H_a \times F = C_a$ wherein H_a has the former dimensions, Btu per hr. per sq. ft. equiv.; F is a coefficient to convert H_a to a cash value,

(*) Since this series of articles was prepared, the author, Ralph E. Gibbs, has passed away. See Necrology. One more article will complete the series.

TABLE 1—Values of H_s for different values of F and C_s

$$H_s = \frac{C_s}{F}$$

$Fx10^6$	C_s Values							
	.05	.06	.07	.08	.09	.10	.11	.12
6	8350	10000	11650	13300	15000	16700	18350	20000
8	6060	7500	8750	10000	11250	12500	13750	15000
10	5000	6000	7000	8000	9000	10000	11000	12000
12	4160	5000	5830	6660	7500	8320	9170	10000
14	3570	4280	5000	5700	6430	7140	7870	8560
16	3120	3750	4380	5000	5620	6240	6880	7500
18	2780	3340	3890	4440	5000	5560	6120	6680
20	2500	3000	3500	4000	4500	5000	5500	6000
22	2270	2730	3180	3640	4090	4540	5000	5460
24	2180	2500	2920	3330	3750	4160	4580	5000
26	1920	2310	2690	3070	3460	3840	4230	4620
28	1785	2140	2500	2860	3220	3570	3930	4280
30	1666	2000	2330	2660	3000	3332	3670	4000
32	1560	1875	2180	2500	2810	3120	3440	3750
34	1470	1765	2060	2350	2650	2940	3240	3520

TABLE 2—Values of H_s computed from formula

Length	Diameter						
	6	7	8	9	10	11	12
60	9070	13780	19750	27300	36500	47500	60700
80	5280	8000	11500	15900	21200	27600	35300
100	3460	5250	7500	10400	13900	18100	23200
150	1710	2590	3720	5140	6870	8950	11400
200	1065	1615	2320	3200	4280	5570	7130
250	745	1130	1620	2240	3000	3900	5000
300	565	860	1225	1700	2270	2950	3770
350	450	685	980	1350	1810	2350	3010
400	370	560	805	1110	1485	1930	2470
450	280	427	610	845	1130	1470	1880
600	179	270	390	535	720	930	1190

cents per hr. per sq. ft. equiv. of kiln shell surface; C_s is the cost per hour for providing and maintaining this square foot equivalent of kiln shell surface.

The coefficient F is not difficult to determine. With coal delivered to the kiln at $6.00 per ton of 2000 pounds, then its cost per pound will be 0.3¢. And if the heating value is 13,500 Btu per lb., then each Btu costs .0000222¢, or 22.2×10^{-6} cents. Thus F_c = Cost per ton/2000 × Btu per lb. = cost per Btu.

With Bunker C oil at 6¢ per gallon, then $F_o = 6¢/140{,}000 = 43 \times 10^{-6}¢$.

C_s, the cost of providing and maintaining a square foot equivalent of kiln shell surface, can be evaluated by $C_s = C_d + C_i + C_b + C_m + C_a$ wherein C_d is the depreciation charge per sq. ft. per hour; C_i is the interest charge per sq. ft. per hour; C_b is the brick lining cost per sq. ft. per hour; C_m is the maintenance cost per sq. ft. per hour; C_a is the insurance and miscellaneous charge per sq. ft. per hour.

Thus C_s is the operating cost per hour for providing and maintaining each square foot equivalent of kiln shell surface.

Simply as an example, let us approximate a value of C_s for the purpose of illustration. Let it be assumed that an 8 x 125 ft. kiln installed costs $100,000. It is to be depreciated in ten years. The interest charges are 5 per cent. The brick lining in the coolest end costs $2.00 per sq. ft. which is replaced every five years. Maintenance charges are 1 per cent. Insurance and miscellaneous charges are 5 per cent. Then the surface involved is equivalent to 3130 sq. ft. of kiln shell surface. So:

	Per sq. ft. per year
C_d = $100,000/(10 × 3130)	= $3.20
C_i = (.05 × 100,000) /3130	= 1.60
C_b = $2.00/5	= .40
C_m = (.01 × 100,000) /3130	= .32
C_a =	1.60
Total	$7.12

There are 8,760 hours per year, so that $C_s = 712¢/8760 = .0815¢$ per sq. ft. per hour.

This is the hourly cost of providing and maintaining each square foot of kiln shell surface involved. This standing charge of .0815¢ per sq. ft. per hour is equivalent to 0.272 pounds of coal per sq. ft. per hour at $6.00 per 2000 pound ton which, in turn, is equivalent to 3660 Btu per sq. ft. per hour.

With oil at 6¢ per gallon, this is equivalent to .0136 gallons of oil per square foot per hour, or 1900 Btu per sq. ft. per hour.

The value of H_s for the last 10 ft. section of the 8 x 125 ft. kiln has been computed from the relation given above as 5120 Btu per hr. per sq. ft.

It is seen from these figures that, for the conditions of our illustrative example, the kiln is too short. With coal, the cost of the surface justifies extracting heat from the gases until the value of H_s equals 3660 Btu per hr. per sq. ft., while with oil, the cost of the surface justifies extracting heat from the gases until the value of H_s equals 1,900 Btu per hr. per sq. ft.

In order to have more comprehensive data for determining the economical sizes of rotary kilns, the tables have been developed.

The values of H_s also can be computed from the formula which relates the physical dimensions of the kiln to this item. Table 2 illustrates these relations.

Data from the two tables can be combined as shown in the graph. With this material in the combined form, we are in a position to determine the economical length of the kiln quite simply.

In the example of the 8 ft. diameter by 125 ft. long kiln which we assumed previously, and under the conditions given, it is seen that this kiln is too short both for coal and for oil firing. With C_s equal to .0815¢ and F_o equal to 22.2×10^{-6}, the value of H_s is about 3750 Btu per sq. ft. per hr. This ordinate intersects the 8 ft. curve for L vs. H_s at a length of about 150 ft. In other words, the conditions postulated, the kiln will have its most economical length for coal firing when it is about 150 ft. long.

The story for oil firing is altogether different. In order to have the value of H_s equal 1990 Btu per sq. ft. per hr., the kiln must be about 220 ft. long.

Thus it will be seen that the economical length of the kiln will depend upon the cost of the fuel, all other conditions remaining constant. With gas at 5¢ per Therm, the kiln, as postulated in the example, should be about 250 ft. long to have its most economical length.

Any factors that tend to lower the value of C_s will favor an increase in the length of the kiln, when F remains constant. Thus the amortization period in the above example was taken as 10 years. Had this been taken at 20 years, C_s would be about .053¢ instead of .0815¢, and the 8 ft. kiln, on coal, would have an economical length of about 165 ft. instead of 150 ft.

In the same way, any factors that tend to increase the cost of fuel will favor an increase in the kiln length, other factors remaining constant.

On the other hand, should the values of F and C_s increase or decrease in proportion, the economical length of the kiln will not alter.

Paper and paperboard making-XI

HARRY WILLIAMSON

Cylinder Machine . . . The overflow type vat

THREE MAJOR FACTORS of operation cause the overflow type vat for cylinder mold operation to differ from the standard or more commonly used counterflow type:

(1) A greater *total* volume of stock and water (the mixed volume from which the sheet is formed) than is actually used per revolution of the cylinder mold is in constant supply to the formation area.

(2) This unused volume is controlled by an overflow system and returned in continuous supply to the immediate supply system to the mold.

(3) The mixed volume is delivered to the formation area, the circle, so that the flow speed of the mixed volume is traveling in the *same direction* as the rotation of the cylinder mold. In the operation of the counterflow type vat, the delivery of the mixed volume to the formation area is *against* the rotation of the mold.

There are several designs of this type vat in use. Some have been evolved to suit the local operating conditions of a given mill and the more streamlined designs are the product of the paper machinery builders.

The same increasing demand for paper products which provided the impetus to speed up the fourdrinier machine had a similar effect on the manufacturing of boxboard by cylinder machine operation. Possibly the use of folding boxboard for the packaging of cereals was the biggest individual factor pushing the cylinder machine operations to faster and faster running speeds. A further problem in addition to formation at higher speeds faced the designer of a cylinder mold vat (these statements can still be read in the present tense) and that was the problem of the *quality* of the cylinder mold formation as compared to the sheet formation obtained by fourdrinier operation. Using the figure 100 per cent as unity value, then cylinder mold formation, under average commercial conditions, can only be rated between 80 per cent to 85 per cent.

Under steadily increasing demand for more production of better quality, there was the problem to be solved—faster machine speeds with better formation. The evolution and development of the overflow type cylinder mold vat as we know it today is a partial answer. Speeds a little short of 600 fpm have been reached and formation quality has been raised from below 75 per cent rating to the maximum of 85 per cent cited above.

In our acceptance of 100 per cent figure as unity in judging formation a brief explanation is in order. *Commercial* formation of paper is meant, not laboratory hand sheet formation. A No. 1 bond sheet would be classified as unity for formation. A sheet which will accept a four-color print job with a maximum clarity and stand out of printed matter with a minimum use of printing inks and a minimum *cost* of makeready time also would be classified as unity formation.

Our modern standard patent white folding boxboards can be classified as unity formation for four-color printing but not in the *cost* of original makeready or in the number of imprints obtained from a makeready. The pressures used in printing to overcome the existing inequalities of the formation of the board are necessarily much higher and, therefore, more wearing on the makeready than those used on a higher quality of formation.

The PRIMARY change in vat design to meet these requirements was that of flow speed direction. The quality of formation and speed desired was that already obtainable by fourdrinier operation so it was logical to more nearly duplicate the hydraulic conditions of this operation.

Formation problems

As we know, the delivery of the mixed volume to the fourdrinier machine wire is on a horizontal plane and the *best* formation from any given stock is obtained when the VELOCITY of the mixed volume EQUALIZES to the linear foot speed of the running wire on which the paper is formed *after* the mixed volume is in FULL contact with the traveling wire. We know that if the velocity of the mixed volume is *faster* than the linear foot speed of the wire, we will have a FORWARD WAVE in the sheet formation, and, conversely, with a slower velocity, we will have a BACK WAVE showing in the look-through of the sheet. While a slight FORWARD WAVE is desirable in the formation of an envelope sheet for increasing the folding qualities, it nonetheless detracts from the 100 per cent rating of formation value. Similarly, a BACK WAVE in the formation of a sheet has a tendency to *reduce* the tensile and stretch tests in the machine direction and of course also detracts a few units from the formation value.

The *best* formation is that which is effected CONTINUOUSLY and EQUALLY over *each* square inch of the wire surface, and we know from fourdrinier operation that this condition is *only* in effect when the mixed volume is delivered at a VELOCITY which will insure a continuous and even distribution of the mixed volume

over the whole forming surface of the wire, and that the forming wire mesh *shall not* be running *away* from the floating fibers; neither will the floating fibers be traveling *faster* than the speed of the wire, as they are settling from a state of suspension in water to a state of rest on the traveling wire mesh. We also must remember that formation is EFFECTED by the drainage of the water from the mixed volume THROUGH the wire mesh. As the velocity of the mixed volume is *increased* faster than the linear foot speed of the wire mesh then the RATE of drainage through the wire mesh is decreased. The fibers, floating in suspension in water, take a LONGER time to settle through the SAME DISTANCE as the velocity of the flow is increased.

Such were, and still are, the hydraulic velocity conditions pertaining to the formation of a sheet of paper by the fourdrinier method. They became the guide to the design of the overflow type vat for cylinder mold formation. With these facts in mind we can better understand the approach to the problem, the results obtained to date, and an appreciation of the problems still remaining to be solved if we are to achieve operating speeds and formation values by cylinder mold operation comparable to those in daily commercial practice by fourdrinier operation.

One more comment on known fourdrinier formation and then we will be in a position to discuss flow velocities as applied to cylinder mold formation. All fibers will flow streamlined lengthwise in water and *remain lengthwise* until disturbed from this flow position by some turbulence or collision with each other. This is the cause of the difference in grain in any sheet of paper. Many papers such as creping tissues, etc., require the greatest possible tensile and stretch in the machine direction. When making these papers by fourdrinier operation it is customary to shut down the shake device so that there will be no sideways motion imparted to the formation area to cause the fibers to collide with each other while still in suspension in water and in the act of formation. Similarly, when we want to make a sheet with tensile, stretch and tear more nearly equal with and across the grain, we either increase the speed of the shake stroke, adjust the length of the shake stroke, or both, in order to create more fiber collisions with each other and thus obtain a formation with the majority of the fibers evenly crossed with each other.

We have no shake device on the cylinder mold type machine and as we increase velocity of the mixed volume flow there is a greater tendency for a greater streaming of the fibers in formation resulting in a machine direction sheet.

What is velocity for?

The VELOCITY of the mixed volume delivered to and traveling round the circle, the formation area, is a subject of much discussion and, therefore, differences of opinion among cylinder machine operators. These opinions vary from 0.2 of the mold speed in feet to a speed equal to the mold speed according to the grade being made and the experience of the operator. The grades are as wide apart as long fibered, free, coarse stock for roofing felt to comparatively short, clay loaded, slow acting stock for patent coated liner. In a handbook of this nature it behooves us to define more clearly the function of velocity as the word pertains to the mixed volume from which paper is formed on a cylinder mold.

VELOCITY is a distance traveled by time; it is a function of delivery to a specified point in a required time. In our papermaking, it is the delivery of the mixed volume in continuous supply to the FORMATION AREA. The words *velocity* and *turbulence* must not be confused with each other. We can have one without the other. For practical operating purposes in the ACTUAL ACT OF FORMATION we have *no further use* for velocity as such. In the actual act of forming GENTLE TURBULENCE culminating in EVEN DISTRIBUTION of fiber is the liquid movement which will *best* accomplish our purpose of EVEN formation.

Effect of turbulence

Some confusion of thought is caused by the fact that formation on the cylinder mold takes place while the wire mesh on which the sheet is being formed is *submerged* in the liquid volume; we cannot see the ACT OF FORMATION. In fourdrinier operation the ACT OF FORMATION is visible; the *velocity* delivery to the wire traveling in a straight horizontal line instead of a circle of mold submerging itself out of sight, the traveling wire mesh actually *supporting the weight* of the mixed volume delivered to it. We can see the action, the TURBULENT ACTION of the mixed volume caused by the INTERCEPTION of velocity by the effect of the sideways motion imparted to the formation area by the action of the shake device. We can see the water draining through the wire mesh by the force of gravity and by the capillary attraction of the revolving tube rolls supporting both the traveling wire mesh and the liquid volume in the ACT OF FORMATION into a sheet of paper.

As all of these simultaneous actions and re-actions of the liquid volume in the act of forming a continuous sheet of paper by fourdrinier operation are visible, they can be TIMED. In cylinder mold operation we can *only estimate* and *speculate* on what is happening because we *cannot see* the act of formation ROUND the whole formation area of the circle. The only *actual* points of formation available to observation are the points of SUBMERGENCE and EMERGENCE of the cylinder mold as it rotates through the mixed volume contained in, or as in the use of the overflow vat, passing *through* the formation area as represented by the circle.

This passing the mixed volume in continuous flow *through* the formation area is an effort to reproduce the same hydraulic flow values of delivery which, observed, checked and timed, result in unity formation on the fourdrinier machine when the mixed volume is delivered to the forming surface with the VELOCITY FORCE in the *same* direction the wire is traveling. However, in this discussion of *velocity* there still remains one very important difference, and this difference compounds other factors of formation which, to date, have held us down to the vicinity of 600 fpm by cylinder type formation as compared to 1500 fpm by fourdrinier formation.

This important difference, and the resulting factors

relating to formation, may be more readily understood by the following concise summation:

Velocity and Formation

(1) By delivery of the mixed volume on a HORIZONTAL plane, the VELOCITY FLOW FORCE is either fully *expended* or *intercepted* and *diverted* when one-third or less of the formation area of the wire surface in actual formation use is *supporting* and *carrying* the *total* volume of liquid from which the sheet is being formed.

(2) By delivery of the mixed volume *round* a formation area *through* which the forming unit, the cylinder mold, rotates some of the INITIAL VELOCITY FLOW FORCE is *still* in effect, over *all* of the formation area in use, *all of the time* formation is taking place. As the formation unit *does not* carry the *total* liquid volume from which the sheet is forming, the velocity force necessary for delivery purposes *cannot be* fully intercepted and diverted to usefulness as an aid to the ACT OF FORMATION.

In the first instance, VELOCITY FORCE consummates the function of delivery of the liquid volume to the forming surface and, by engineering devices such as the imparted shake motion is then *intercepted* and by *planned, timed, skilled* application, the still unexpended velocity force is *diverted* to create *desired* results in the formation of the sheet of paper. This is made possible by the forming surface, the traveling wire, carrying and *supporting* the *total* volume of liquid used for formation purposes. Under these conditions velocity force having completed the function of delivery of the required volume in the required time is instantly transposed by another force applied at right angles to the flow force, the compounding of both forces resulting in a GENTLE, CONTROLLED TURBULENCE resulting in unity formation. (We have now found that in fourdrinier speeds in excess of 1400 fpm the velocity force necessary to deliver volume to *equal* this speed is so great, and the *time* the mixed volume is under the influence of the shake motion, is so fraction second small the *full* velocity force cannot be intercepted and diverted from stream flow by the action of the shake; therefore, the formation shows a greater preponderance of machine direction formed fibers.)

In the second instance, *none* of the velocity force is intercepted by the *planned* application of a *mechanical* diverting force. Once the initial velocity force is in application, *any* diversion of the fibers in suspension in the liquid volume from stream line flow is:

(1) Incidental to the dimensional area of various sections of the formation area, the circle through which the flow is taking place;

(2) The effective formation pressure created by the static head or differential in water levels between the outside and inside of the cylinder mold;

(3) The adjustment of the overflow dam after formation is complete in the use of the overflow type vat or the rush of water through the wire mesh, thus changing direction of flow at the commencement of formation in the operation of the counter flow type vat.

Now, suppose we examine and enumerate those facts which we actually know pertaining to the velocity of flow of the mixed volume round the formation circle of two molds. One 36 inches in diameter and the other 60 inches in diameter, both counterflow type vats. Then we will enumerate the same values of the same diameter molds of the overflow type vats. With any type cylinder mold we have noted that only approximately 242 degrees of the total circumference of the cylinder mold is in use as actual forming area per revolution of the mold.

Velocity is described as distance divided by time; in our discussion this means the velocity force necessary to supply the required volume to the required point or points of formation area in a time period coincident with the demand of the forming area of the revolving cylinder mold in rotation.

Velocity Variations

From this we may state velocity required will vary as:

(1) The revolutions per minute, and, therefore, the demand capacity of the revolving cylinder mold is varied.

(2) The greater or lesser the distance the mixed volume has to travel to reach the furthest point of formation area from the initial velocity head.

(3) As initial formation point is the greatest instantaneous use of the mixed volume, then velocity required also will vary as to the distance of initial formation point from initial velocity head.

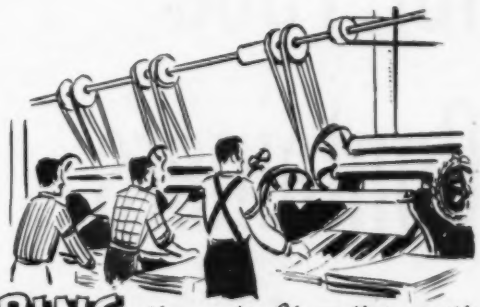
In fourdrinier operation we have noted that formation commences instantly at the point of initial velocity head and velocity, as such, is intercepted simultaneously from linear flow direction.

In the operation of the *overflow type vat,* the cylinder mold and the mixed volume are traveling *in the same direction.* Formation commences instantly at the point of initial velocity head as is the case with fourdrinier operation. However, in this instance THE APPROACH FLOW VELOCITY of the mixed volume is intercepted by the revolving cylinder mold; formation commences at point of contact; and the *unused remainder* of the mixed volume changes direction flow from a horizontal plane to a vertical plane and becomes VELOCITY HEAD or the force necessary to deliver requirements for *further* formation in *decreasing* demand until the point of formation the greatest distance *from* initial velocity head is reached. The greatest proportion of the mixed volume *actually used* to form paper is used in the *immediate vicinity* of INITIAL VELOCITY; the part of the formation area known as the FORWARD CIRCLE.

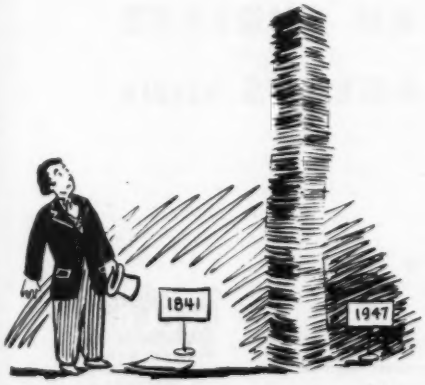
In the operation of the *counterflow type vat,* the cylinder mold is revolving in the *opposite* direction to the velocity flow direction and away from the approach flow. In this operation formation commences at the point *farthest away* from the initial velocity. The initial formation and greatest proportion of formation takes place in the formation area known as the BACK CIRCLE. This means that when operating a counter flow type vat a greater volume has to be supplied a longer distance for ACTUAL FORMATION USE as distinct from overflow control purposes. This requirement has, of course, a direct bearing on the height of velocity head used.

PAPER SKETCHES

In the days of hand-made paper, vatmen and couchers could easily be spotted by their red muscular arms and stooped backs.



COVERING line-shaft pulleys with paper was a popular custom among machine shops of the 1880's. Application was made by gluing strips of manila paper to the iron face of the pulley so that the ends of the paper strips just met without overlapping.



109 years ago a convention of papermakers meeting in New York estimated the value of paper manufactured in the United States at about $15,000,000 yearly. In 1947 the actual value was $3,751,652,000.

THE PATENT given by the French government in 1799 to N. Louis Robert for his invention of the pioneer "fourdrinier" machine was for a period of 65 years.

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The Paper Industry Association News

Packing Clinic is Feature of Mich. Supts. Meeting

Representatives of ten paper mills in the Michigan area attended the Packing Clinic put on by J. W. Hemphill, manager of the pulp and paper industry department of Johns-Manville Corp., New York, which was a feature of the November 16 dinner meeting of the Michigan Division of the Superintendents Association. Fifty members were in attendance.

O. W. Callighan, Edgar Bros. Co., chairman of the Michigan Division, presided at the meeting. Mr. Hemphill's formal remarks, presented immediately after the dinner hour, were followed with a question and answer period which lasted nearly three hours. Harry E. Weston, national secretary-treasurer of the Association, was moderator of the discussion period.

(Read article by Mr. Hemphill on page 1080 of this issue.)

American Section French Engineers Ass'n Resumes Its Activities

The American Section of the Societe de Chimie Industrielle has been reconstituted after inactivity which began with World War II. Dr. Worth Wade, American Viscose Corp., was chosen president of the Section; Dr. R. S. Aries, consulting chemical engineer, was named a vice president as was Jean R. L. Martin of Coty, Inc.

The council includes M. T. Bogert, F. S. Carver, Prosper Cholet, J. V. N. Dorr, Eugene Houdry, E. C. Kunz, D. F. Othmer, and A. H. Waitt. Jerome Alexander, chosen honorary secretary, was one of those who originally formed the Section in 1917.

National Fibre Can and Tube Ass'n Appoints Comm. to Contact Govt.

A committee to work with government agencies has been set up by National Fibre Can and Tube Association so that military contracts for shell casings, flare tubes, and ammunition containers may be accelerated. This action was taken at the group's recent semiannual meeting at the Astor Hotel, New York.

The committee will ask the Government to permit member manufacturers with war contracts to use federal winding machines used in manufacturing the wartime items. Some form of price protection will be sought for war contracts similar to escalator clauses covering advances in materials used.

Wood Pulp Importers Ass'n Elects New Officers

At the annual meeting of The Association of American Wood Pulp Importers, held in New York City December 7, the following officers were elected for 1951:

President.....Stanford G. Blankinship
Vice President.....Albert Blattmann
Secretary.....Richard F. Kist
Treasurer.....V. Ramsay
Director.....James Donaldson

TWO SPEAKERS ADDRESSED THE SECOND meeting of the season of Lake Erie Papermaker's and Converter's Association, held November 17. Subject of the meeting was Gravure Printing; Frank B. Johnson of Intage Division of Interchemical Corp, presented a paper entitled "The ABC's of Gravure," and Joseph Martin of the Champlin Co., Inc., discussed the subject from the press manufacturer's viewpoint. Forty-six LEPCA members attended.

A DISCUSSION OF QUALITY CONTROL will be a feature of next month's meeting of the Ohio Section of TAPPI, planned for Thursday, February 8. Since the meeting will be held jointly with the Cincinnati Club of Printing House Craftsmen, the Hotel Sheraton Arms, Cincinnati, will be the meeting place. The discussion, led by two speakers representing Scott Paper Co., will follow a 6:30 dinner.

Coming Events

Jan. 9—Meeting of Metropolitan Section of TAPPI; subject will be "New ideas in the use of paper for automatic packing."

Jan. 15—Chicago Section of TAPPI will meet at the Chicago Bar Association, Chicago.

Jan. 15-18 — Plant Maintenance Show and Conference, to be held at the Public Auditorium, Cleveland.

Jan. 19—Lake Erie Papermakers and Converters will meet at the Hickory Grill, Cleveland, Ohio.

Jan. 19—New England Section of TAPPI will meet at the Roger Smith Hotel, Holyoke, Mass.

Jan. 22-26—10th International Heating and Ventilating Exposition, sponsored by the American Society of Heating and Ventilating Engineers, will be held at the Commercial Museum, Philadelphia.

Jan. 24-26 — Annual meeting of the Technical Section of CPPA, to be held at the Mt. Royal Hotel, Montreal, Can.

Jan. 25—Delaware Section of TAPPI will meet at the Engineers Club, Philadelphia.

Feb. 6 — The Pacific Coast Section of TAPPI will hold its annual engineering meeting at Olympia, Wash.

Feb. 8—Ohio Section of TAPPI will meet at the Manchester Hotel, Middletown, Ohio.

Feb. 16—Lake Erie Papermakers and Converters will meet at the Hickory Grill, Cleveland, Ohio.

Feb. 19-23—Paper Week, annual meeting of the American Paper and Pulp Association and paper groups, at the Waldorf-Astoria Hotel, New York City.

Mar. 6—Meeting of Metropolitan Section of TAPPI at Fraunces Tavern, New York: subject will be "Use of paper by business."

Mar. 8—Ohio TAPPI will meet at the Manchester Hotel, Middletown, Ohio.

Mar. 13—Lake States Section of TAPPI will meet at Stevens Point, Wis.

Mar. 22—Delaware Section of TAPPI will meet at the Engineers Club, Philadelphia.

April 3 — Meeting of Metropolitan Section of TAPPI; subject will be "Machinery innovations in the industry."

April 13 — Annual meeting of Pacific Coast Section of TAPPI; featuring annual Shibley Award contest.

April 17-20 — 20th National Packaging Exposition of the American Management Association, in Atlantic City, N.J.

May 1—Metropolitan Section of TAPPI will meet; subject will be announced at a later date.

May 4-5 — Spring meeting of the Northwestern Division of the Superintendents Association, to be held at the Radisson Hotel, Minneapolis, Minn.

May 7-11—Greater New York Industrial Show, sponsored by New York Technical Societies Council, at the Armory, New York.

June 7-9 — Summer meeting of the Technical Section of CPPA, to be held at Bigwin Inn, Lake of Bays, Ont., Canada.

June 24-29 — Annual meeting of the Superintendents Association to be held at Multnomah Hotel, Portland, Ore.

Illustration from the Bettmann Archive

Forerunner of a Free Press

Always the printing press has been an instrument for protest against tyranny, though often it has had to operate in secret. During the French Revolution, printers set up their mobile presses in streets and alleys and turned out pamphlets until, discovered by gendarmes, they picked up their portable plants and fled to some underground refuge.

In America freedom of the press is one of our most jealously guarded possessions. Here the printing press and plentiful paper have made possible the distribution of books, magazines and newspapers to all the people at little cost. Knowledge, culture and entertainment, spread without restriction, have helped to make and keep this a nation of free people with the highest standard of living in the world. Supplying this free press with its basic product—paper—is one of the great achievements of the American pulp and paper industry.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

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The Paper Industry Names in the News

Dr. Ritter Retires from Forest Products Laboratory

Thirty years of fundamental research came to a milestone for Dr. George J. Ritter on December 31 when he retired from his position as chemist at the U.S. Forest Products Laboratory, Madison, Wis.

Dr. Ritter, a native of Appleton, Wis., became associated with the Laboratory in 1920. He had served previously as superintendent of schools at Campbellsport, Wis. Later, while doing graduate study, he was chemistry instructor at the University of Wisconsin. It was there that he earned his bachelor's, master's, and doctor's degrees.

Research conducted by Dr. Ritter laid the groundwork for much of our modern paper and plastic industries. Some of his most important work is still unpublished.

As to his future plans, Dr. Ritter states he has none in particular. However, he states that "if the national emergency makes it necessary, I'll be happy to go back to work wherever I'm needed."

Dr. H. K. Ihrig now V.P. in Charge Research at Allis-Chalmers

Upon his election as vice president in charge of research for Allis-Chalmers, Milwaukee, Dr. H. K. Ihrig has resigned as vice president and director of laboratories of Globe Steel Tubes Co., Milwaukee.

Dr. Ihrig, whose resignation from Globe ended a 17-year association, holds 19 patents in the field of metallurgy. Cited by the University of Wisconsin in 1949 for his important contributions and inventions, he holds the Robert W. Hunt medal for 1947. The medal is awarded by the American Institute of Mining and Metallurgical Engineers for the best paper published on iron and steel research.

Ticoulat Made V.P. of Crown Zellerbach Corp.

Among the post-holiday announcements was the appointment of G. J. Ticoulat as vice president of Crown Zellerbach Corp., San Francisco, Calif.

Since 1932, Mr. Ticoulat has been manager of sales of Crown Willamette Paper Co. division of Crown Zellerbach. He began work with Crown Willamette's San Francisco office 33 years ago in a stenographic-clerical capacity. After serving in World War I, he worked through such jobs as the wood mill, beater room, and paper mill at C-W Foriston (Calif.) plant, ending up there as second hand on a paper machine. He again took up clerical work in the San Francisco Sales Office, advancing into the position of sales manager in 1932.

Frank Thompson Follows Cook as Res. Mgr. of Westvaco, Charleston

Filling the vacancy left with the retirement of Theo. A. Cook, resident manager of the Charleston, S.C., plant of West Virginia Pulp and Paper Co. (Cf. P.I., December, 1950), L. Frank Thompson has been appointed resident manager of the plant.

Mr. Thompson has been associated with the Charleston plant since its inception in 1936. Entering West Virginia employ as an employment clerk, he was later made personnel manager, then assistant manager in charge of administration, and in 1949 became assistant plant manager.

L. Frank Thompson

Marvin Jones

Marvin Jones now with Lockport Felt Co.

The appointment of Marvin C. Jones in a sales capacity has been announced by Lockport Felt Co., Newfane, N. Y. He will cover the states of Ohio, Indiana, Illinois, Missouri, Kansas, and Iowa.

Mr. Jones was associated with the Michigan Carton Co., Battle Creek, Mich., for about 20 years. He left that company in the spring of 1949 to go with Weyerhaeuser Timber Co., Springfield, Oregon. He left that connection in May, 1950. (Cf. P.I., May, 1950)

Longnecker Promoted by Sutherland Paper Co.

The appointment of Harlan T. Longnecker as manager of Sales Division C, Sutherland Paper Co., Kalamazoo, Mich., has been announced. Mr. Longnecker will succeed the late Leo J. Dickey (see Necrology).

With Sutherland since 1937, Mr. Longnecker has served in the sales department in various capacities. In 1943 he was made assistant manager of Sales Division C, which position he has held until the present time.

Fred L. Crossman Succeeds Late Father as President of Lindsay Wire

At a special meeting of the board of directors of The Lindsay Wire Weaving Co., Cleveland, Ohio, Fred L. Crossman, former works manager, was elected president of the company. He succeeds his father, the late A. Fred Crossman, in the position. (Cf. P.I., Necrology, December, 1950)

At the same meeting, Robert H. Crossman was elected assistant treasurer.

Bessmer, Timken Purch. Director Promoted—Is Succeeded by Paul Young

The appointment of Dwight A. Bessmer, director of purchases to the position of assistant to the president was announced by the Timken Roller Bearing Co., Canton, Ohio, effective December 20.

Paul E. Young, who has been an expediter in the purchasing department since 1940, has been named to the office of director of purchases. R. J. Archibald, a member of the purchasing department since 1942, has become assistant general purchasing agent.

Top Changes at Ryerson

Following a meeting of the board just before Christmas, Jos. T. Ryerson & Son, Chicago, announced that Charles L. Hardy had been elected president.

Mr. Hardy succeeds Everett D. Graff

who was made chairman of the executive committee at the same meeting. Thomas Z. Hayward was elected vice president in charge of sales. Hardy and Hayward were elected directors and members of the executive committee. These changes were effective Jan. 1.

Mr. Hardy moves up to the presidency from the office of assistant to the president. He first became associated with the Ryerson organization in Boston during the year 1927. In 1945, he was made manager of the company's plant in Philadelphia and in 1949 he moved to the general offices in Chicago as assistant vice president in procurement, later becoming assistant to the president. Mr. Hayward was formerly general manager of sales for the group of 13 Ryerson steel service plants.

W. G. Dedert

Warren E. Hesler

Whiting Sales Staff Changes

Several additions have been made to the sales staff of Whiting Corp., Harvey, Ill. The New York staff has been enlarged with the appointments of William G. Dedert and Warren E. Hesler. Both men previously have been associated with Swenson Evaporator Co., a division of Whiting.

R. E. Florine has been chosen district manager of a new Whiting district sales office at 350 Skinner Building in Seattle. Mr. Florine has been a sales engineer in Whiting's New York sales office for the past five years.

Resident sales engineer at 637 Penton Building, Cleveland, will be A. C. Kukral, associated with Whiting as a sales engineer since 1947.

Dr. Edwin R. Gilliland, professor of chemical engineering at Massachusetts Institute of Technology, and *Henry L. Gilbert, Jr.,* vice president of Dewey and Almy Chemical Co., have been elected to the Dewey and Almy board of directors.

Donald S. Leslie, first vice president and general manager of Hammermill Paper Co., has been elected to the board of directors of Rayonier, Inc., Erie, Pa. Also elected a member of the firm's executive committee, Mr. Leslie fills one of the two board vacancies at Rayonier left with the recent resignations of Edward Bartsch and William S. Lucey.

Robert A. Miller, formerly advertising manager for Sier-Bath Gear & Pump Co., Inc., North Bergen, N.J., and assistant sales manager for the firm's Coupling Division, has been appointed sales manager of the Gear Coupling Division. He is to be in charge of appointing representatives for the firm's new line of flexible gear couplings.

Allan L. Halstead, national sales manager of Charles Bruning Co., Inc., New York, and *Ralph Beck,* general manager of the company's Chicago sales district and machine manufacturing division, have been named vice presidents of the company.

Raymond E. Marsh, assistant chief of the Forest Service of the U.S. Department of Agriculture since 1936, ended 40 years of work with the Forest Service with his retirement on December 31. He will be succeeded by *Edward C. Crafts,* who has been chief of the Division of Forest Economics since 1945, and close to all phases of forestry.

Chester A. Gage, vice president in charge of sales for National Starch Products Co., Inc., has retired from active business, but will remain as director and consultant of the firm.

R. E. Florine

Walter H. Behnke

Tippit Moved Up to P.A. at Reliance Electric— Behnke Succeeds Him

Former manager of the order and planning department of The Reliance Electric & Engineering Co., C. Carlisle Tippit, has been appointed general purchasing agent of the firm. He has been associated with the firm since 1945.

Mr. Tippit's successor in the order and planning department is Walter H. Behnke, formerly a member of the firm's applied engineering staff. Mr. Behnke will administer sales planning, and will be responsible for order-pricing and sales-service functions of the home office.

John G. Bucuss, general manager of the Strapping Division of Acme Steel Co., Chicago, has been elected president of the Materials Handling Institute for the 1951 term. Associated with Acme for the past 32 years, Mr. Bucuss has held offices of increasing responsibility with the Institute for the past three terms.

D. S. Denman, for the past 13 years vice president of timber and forestry operations in the Northwest for Crown Zellerbach Corp., has been named to the executive committee by the company's board of directors. He will transfer to company headquarters in San Francisco some time this month.

W. Elliot Pratt, Jr., who has been a director of Hollingsworth & Whitney Co., Boston, since 1939, and assistant treasurer since 1945, has now been elected treasurer. He succeeds *Harry C. Thayer,* who is retiring after 23 years as treasurer. *Dennis E. Cousins,* the company's Mobile (Ala.) mill manager, was elected a vice president.

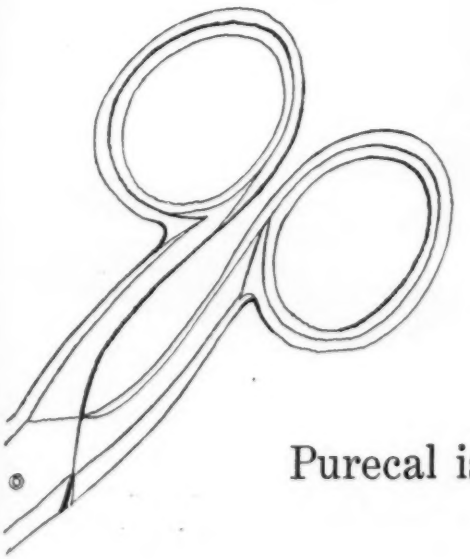
Edward J. Sullivan has established a selling agency in San Francisco to serve as a manufacturers' representative in the Pacific Coast area. During a 25 year career Mr. Sullivan, a member of SAPI and TAPPI, has been associated with Oxford Paper Co., Fraser Paper Ltd., Price & Pierce Ltd., and Dennison Manufacturing Co.; most recently, he served as eastern sales manager of Gould Paper Co.

Carl M. Blumenschein, controller of Container Corporation of America, Chicago, has been appointed chairman of the Controller's Institute, a national committee on employment and placement.

R. S. Cornell has been appointed to the engineering staff of Chemipulp Process Ltd., Montreal, Canada. He was formerly assistant to the manager of technical sales for the Barrett Co.

Norman H. Nuttall has filled the position of manager of the Paper Mills Department of Stein, Hall & Co., Inc., New York, which was left vacant with the resignation of *J. P. Strasser.*

Harold R. Alley has become associated with Charles E. King and Co., Chicago, as manager of the newly created Barrier and Packaging Sales Division.



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The new Division will specialize in the supply of specification materials for both domestic and export packaging to war agencies and war contractors.

M. C. Fairfield, sales manager of Insulite Division of Minnesota and Ontario Paper Co., was named a director of Insulation Board Institute at its annual meeting in Chicago. He served the Institute as president last year.

William G. Mahlman, formerly supervisor of order analysis for both Edward and Nordstrom valves made by Edward Valves, Inc., East Chicago, Ind., has been promoted to sales office manager of the firm. He succeeds *Herbert J. Rowe,* who has been called to active duty with the Marine Corps.

Charles A. Lee, Jr., former sales representative in the New York offices of Gardner Board & Carton Co., Middletown, Ohio, has been appointed manager of retail box sales. He has been associated with the firm since 1946.

James Edward Tipton has been employed as a research junior chemist in the technical department of the A. E. Staley Mfg. Co., Decatur, Ill. He is a 1950 graduate of James Millikin University in Decatur.

L. D. Smithers has been elected executive vice president of Dow Chemical of Canada, Ltd., at Sarnia, Ont. Concurrently, B. Julian Sibold was named sales manager of industrial chemicals and coatings for the company, and will work in Toronto and Southern Ontario.

David S. Landau, vice president and director of The Alling and Cory Co., New York, retired December 1 after 41 years of service to the company. *Charles W. Stuyvesant* will succeed him as vice president and manager.

Charles V. Harrold, vice president in charge of engineering at Harris-Seybold Co., Cleveland, has been elected to the firm's board of directors. Concurrently, *W. R. Spiller,* assistant vice president, has been appointed chief engineer.

Kenneth W. Henderson, formerly advertising manager of the standard Coated Products Division of Interchemical Corp., has been appointed advertising manager of Eastern Corp., Bangor, Me.

The Paper Industry Necrology

James H. Allen

An outstanding figure in the paper industry and a prominent industrialist of the South, James H. Allen, passed away December 18 at his home in Pensacola, Florida. He was 70 years old on November 19.

James H. Allen

Mr. Allen had a long record of productive experience in the paper industry. A native of Kansas, he spent his early years in the sawmill and lumber business of several southern states and became known for his work in forestry and forest products utilization.

In 1924, Mr. Allen became associated with the late Richard J. Cullen in establishing the Louisiana Pulp and Paper Co., Bastrop, La., which plant is conceded to have been the first paper mill in the South. He worked with Mr. Cullen in establishing other southern paper mills, and in 1941 he began operations at the Florida Pulp and Paper Co. at Cantonment, in co-operation with the late J. G. Pace and sons, large timber operators. In 1948, the output of that plant was augmented by the addition of the Alabama Pulp and Paper Co. mill. In 1946, Mr. Allen brought about a consolidation with St. Regis Paper Co., and the Alabama mill was brought into the merger two years later. A multiwall paper bag was added to the Cantonment plant making a completely integrated operation.

As a director of St. Regis and as president of the Florida and Alabama Pulp and Paper Companies, Mr. Allen carried management responsibilities for these southern holdings under the leadership of Roy K. Ferguson, chairman of the board of St. Regis. Shortly before Mr. Allen's birthday in November, St. Regis announced that it would build a third paper mill at Cantonment.

Mr. Allen was prominent in a long list of national and local bodies. Because he was considered a leader in southern industry, he was twice named among the 50 leaders of the South, and in August of 1950, he was appointed by President Truman as a member of the civilian advisory board to the postoffice department.

Surviving are the widow and a son.

Francis J. Welch, superintendent of the paper division of Yawman & Erbe Manufacturing Co., Rochester, N.Y., passed away November 24 at the age of 64. Mr. Welch had been superintendent of the paper division for 10 years.

Jasper Kievit

The vice president in charge of manufacturing of the Crystal Waxing Co., Middletown, Ohio, Jasper Kievit, passed away December 6 at the age of 56. He had been associated with the company, a subsidiary of The Crystal Tissue Co., since 1922, when he helped organize the initial equipment for the waxing company. Later elected to the firm's board of directors, he was appointed works manager in 1939 and vice president in 1940.

During his years with Crystal, Mr. Kievit designed and patented several types of packaging and continuous wax roll equipment, including the equipment used exclusively by the firm for applying metal edging to cutterboxes.

Jasper Kievit

Wm. Brown Bell

Wm. Brown Bell

While on a business trip abroad, William Brown Bell, president of the American Cyanamid Co., New York City, passed away suddenly at Marrakeech, French Morocco. He was 71 years of age.

Mr. Bell became president of American Cyanamid in 1922 and served in that office continuously until his death. He had given valuable assistance during World War I as an advisor in chemical plants of the South devoted to war work. The Chemical Industry's Medal in 1934 for distinguished economic service to the chemical industry was awarded to Mr. Bell, and in World War II he was prominent in work of the N.R.A. For many years Mr. Bell had been a member of the board of directors of the National

Association of Manufacturers. At the time of his death he was an honorary vice president. He was officially interested in many large companies and groups, among which was the Southern Alkali Corp., of which he was a director and vice president.

Ralph E. Gibbs

Well known in the paper industry as a consultant and professional engineer, Ralph E. Gibbs passed away October 10 at York, Pa.

With a fine scholastic background, Mr. Gibbs was well fitted for the profession he followed. After graduating from Pennsylvania State College with a degree of Electro-Chemical Engineer, he matriculated at Johns Hopkins for a time in the study of chemical engineering. For a number of years he was connected with J. E. Baker Co., and he spent one year as a consultant in the lime and paper industry. The years 1942-1950 were devoted first to some work with York-Shipley, Inc., and later to the establishment of his own consulting engineering service to the lime and paper industry.

Mr. Gibbs was a contributor to professional journals, and many of the readers of THE PAPER INDUSTRY have read with interest several articles in a series that has been published during the past several months.

The widow and one son survive.

E. C. Hollingsworth

A pioneer in the fiber container industry and a vice president in charge of sales for River Raisin Paper Co., Monroe, Mich., E. C. Hollingsworth, passed away December 12 at the age of 68.

Mr. Hollingsworth entered the employ of Ohio Boxboard Co. at Rittman, Ohio, as a boy and later went to Robert Gair Co., Brooklyn, N.Y., as plant superintendent. He became interested with the River Raisin firm in 1914 as a sales representative. Opening the New York sales office of the company, he continued as representative there until 1931, when he went to Monroe as general sales manager. He was elected to the board of directors in 1939, and became vice president in 1946. Survivors include the widow, one brother and a sister.

Herbert L. Niehaus, superintendent of the Lockland, Ohio, unit of the Gardner Board and Carton Co. for the past 16 years, passed away December 13 at the age of 58. He had been associated with the mill for 41 years, beginning his work there when the mill was owned by the Richardson Co., and remaining after its acquisition by Gardner. The widow and five children survive.

Ralph A. Hayward

As this issue goes to press, word is received of the passing of Ralph A. Hayward, president of Kalamazoo Vegetable Parchment Co., Parchment, Mich., on January 11. Necrology item will appear in this section of the February issue.

Ralph W. Mudgett, retired midwest manager of Nashua Gummed and Coated Paper Co., passed away December 7. He was 69 years of age. The widow and one son, Waldo, survive.

Claude B. Gilchrist, former personnel and safey director of Bagley & Sewall Co., Watertown, N.Y., passed away December 9. Mr. Gilchrist, who was 60 years of age, had been associated with Bagley & Sewall from 1942 until his retirement last August. The widow survives.

Harry W. Rish, purchasing agent and manager of the jordan filling department of Shartle Bros. Machine Co., Middletown, Ohio, passed away December 2. Mr. Rish, who was 69 years of age, joined Shartle Bros. as a shipping clerk in 1914, and was promoted to purchasing agent soon thereafter.

Arlington Garfield Post, former president of Narragansett Coated Paper Corp., Pawtuckett, R.I., passed away Nov. 22.

Frank L. Farrell, former general manager of United Paper Board Co., Lockport, N.Y., passed away December 14.

Leo J. Dickey, for the past eight years manager of Sales Division C of Sutherland Paper Co., Kalamazoo, Mich., passed away suddenly November 25.

The Paper Industry Safety News

Contest for 1950 Ended— New One Under Way

The Safety Contest among mill members of the Pulp and Paper Section of the National Safety Contest has actually ended for 1950. However, the October scores stand as the latest published record in that Contest with 39 participants having a perfect record. When scores for the last two months of the year have been checked, winners of the various groups will be decided.

January, of course, is the first month in the new annual contest. As soon as contestants are entered, a list of the mills participating will be published.

THE GOVERNOR'S SAFETY TROPHY was awarded to Container Corp. of America's 35-man paper plant at Tacoma, Wash., at the paper industry's joint labor and management safety conferences held November 17 at Seattle. The little plant went through the first 10 months of 1950 without an accident. Accidents in pulp and paper mills in the state of Washington have dropped 66 per cent since 1945.

Los Angeles Chapter of NSC Holds Industrial Award Dinner

Plaques and merit award certificates were presented to 98 contest winners by the Los Angeles chapter of the National Safety Council at its second annual industrial award dinner held December 6 at the Hollywood Roosevelt Hotel.

Attending the banquet were representatives of 173 firms which are participating in the industrial safety contest. Hedda Hopper, Hollywood columnist, was mistress of ceremonies.

ALTHOUGH THE EXACT DATE has not been set, the Southern Pulp & Paper Safety Association will meet in New Orleans, La., the later part of March or the early part of April.

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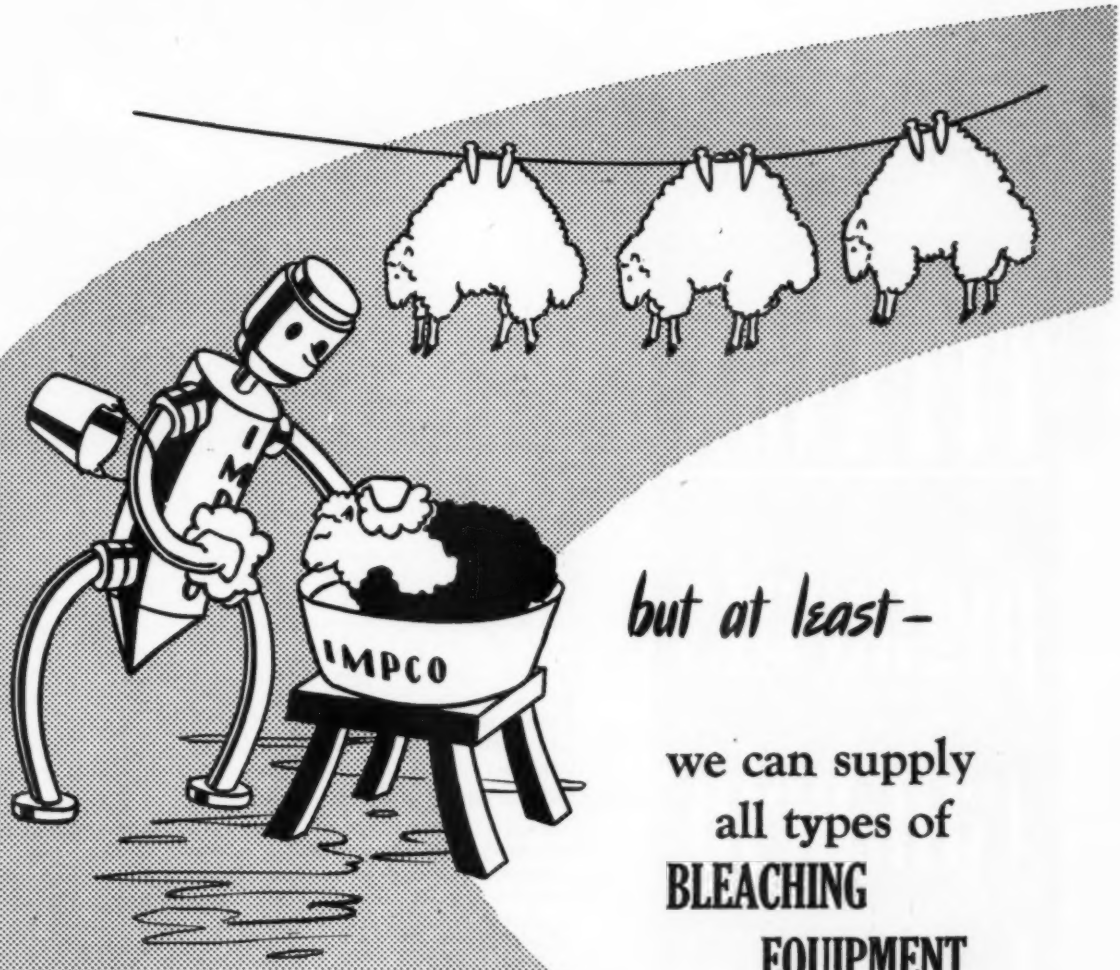

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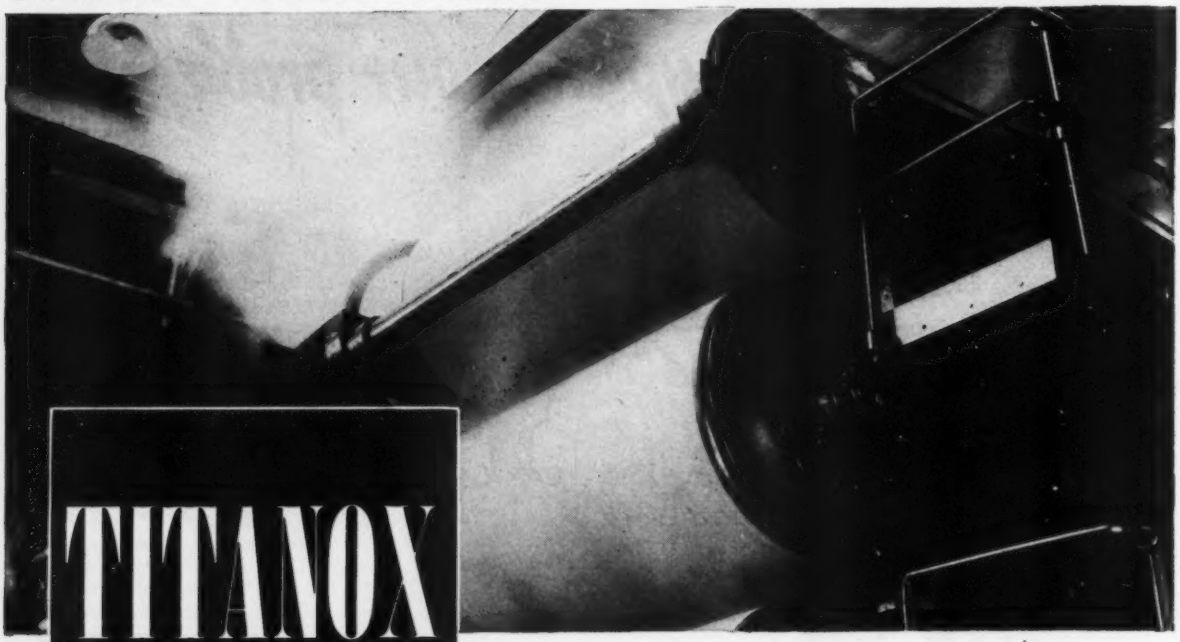

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The Paper Industry International Review

Strawboard shortage faced by Great Britain

The grim position facing British strawboard users in the next two years was outlined by Douglas Potten, chairman of the strawboard section of the National Association of Paper Merchants, when he spoke to boxmakers in Glasgow on November 9.

Dutch mills have suffered a severe loss in confidence in their traditional market, the British, through the limited take-up of permitted imports in 1949. Only 63,000 tons were taken, while permitted licenses for 150,000 tons were issued. The Dutch exporters have turned to new customers, have become box makers themselves, or have developed new products; it will require a long period of satisfactory trading to revive confidence between the two nations. Dutch mills are refusing to give an over-all picture, and are releasing monthly figures.

This November Mr. Potten, together with two other Association officials, saw Dutch exporters in an attempt to restore confidence in the British future. One promise was from Scot boxmakers; a substantial share of strawboard will be used, based on past buying, over a period of perhaps five years. In return for their promise to buy Dutch strawboard, the Scots ask that bending and appearance of strawboard be improved.

It is hoped that this agreement will demonstrate to Dutch mills that British users will buy, and alleviate the Dutch belief that British development of board mills in England and Eire will eventually lead to less reliance on imported boards. Unless the Dutch have such a belief, they will undoubtedly seek alternative outlets or use board in their own country.

The present criticism against strawboard is that it is being made on old lines and is not being improved; board makers reply that they are producing to fill the demand for a low priced commodity, and can improve quality if the purchaser is willing to pay for it.

The frantic demand for board is of greater importance than the discussion of quality when supplies are so very short; present moves are an attempt to obtain better deliveries in 1951 and 1952, which thus far are predicted as extremely tight years.—*Scottish Amalgamated Trade News Agencies*

Dates scheduled for British Industries Fair

The annual British industrial show, the British Industries Fair, will be held April 30-May 11, 1951. Heavy industry displays, including those on pulp and paper, will be centered in Birmingham; other trades will be seen in London.

More than 90 industries will be represented by 3,000 exhibitors in stand space which will total over a million square feet. Thus far it is expected that American buyers at the 1951 show will exceed the 1950 attendance, which was 50 per cent greater than the 1949 turnout. The B.I.F. is a service by manufacturers for buyers.

New Zealand newsprint proposals

The Minister for Forests, Ernest Corbett, has confirmed a report that Bowaters Ltd. has broken off negotiations on proposals for its investment in a project to produce 100,000 tons of newsprint yearly at Murupara, New Zealand.

Mr. Corbett stated that Bowaters was unwilling to invest on the terms offered by the previous Labor Government, although the company felt that newsprint could be profitably produced in New Zealand. The Labor Government proposed a joint corporation in which the New Zealand government would hold 51 per cent of the capital. However, the matter is not settled, for Mr. Corbett said, "There have been many inquiries about Murupara, not only within New Zealand, but from the United Kingdom, Australia and elsewhere. The whole question is now receiving the government's close attention."

Prewar conditions in Korea

The following information, which appeared in the September, 1950, issue of *Indian Pulp and Paper,* while inconclusive in view of the current world situation, will indicate plans which were under way in Korea before the country became a battle field. There is, of course, little or no hope that these earlier expectations will become reality.

Production of newsprint in the Republic of Korea increased materially in 1949; some 2941 metric tons were produced as compared to 803 metric tons in 1948. Although power and raw materials were still in short supply in 1949, those production essentials were materially increased over earlier supplies.

Korea has only two fourdrinier machines; only one of them, located in the country's only newsprint mill, was in operation in 1949. The second machine, which like the one in operation was brought to Korea in 1942 by the Japanese, has never been in operation. The projects under way to increase supply of water and electric power was expected to permit early use of both machines; output in 1950 would have been much higher than in 1949. Annual capacity of the mill was estimated at about 7000 tons.

Imports increased in 1949 from the 1948 total of 1998 tons to 9744 tons. Norway in 1949 supplied 4341 tons, Sweden sent 2689 tons, and Japan exported 1453 tons to Korea. Other sources—Hong Kong, the United Kingdom, United States, Canada, China, Malaya and Australia—supplied 1261 tons. There were no exports.

Although Korea still experienced a shortage of newsprint in 1949, the supply was thought to be more than was required for minimum consumption. In September, the Korean government was beginning to restrict import licenses for newsprint, so that excessive use of foreign exchange would be prevented. All 1949 imports were financed by Korean foreign exchange.

Report from Israel

Because of increasing difficulty in providing foreign exchange for import of paper and board, consumption of these items in Israel is sharply reduced. Authorities have been forced to reduce imports to the minimum; government orders restrict the use of wrapping paper and labels, allow printing of paper bags only under special permit, and prohibit distribution of commercial circular letters as well as the use of paper shopping bags and paper ice cream cups. Luxury packaging is absolutely forbidden.

Publication of a new edition of the Israel telephone directory in Hebrew—as well as the long-planned English edition—has been prevented. Air letters are disappearing, and daily newspapers often can print only one page issues.

During the past two years, annual imports of 2000 tons of newsprint have been made, but supplies are now irregular and insufficient. Stocks of paper are practically exhausted.

DRUPA Duesseldorf 1951

During the years after the war, the graphic trade, the paper-working industries, and all kindred suppliers have overcome most of their damages and meanwhile regained, as regards quantity as well as quality, their pre-war capacity. As for more than 10 years no special exposition was held for these important branches of the industry in Western Germany, there is now an urgent longing for a grand special show by which their own efficiency can be demonstrated in competition with suppliers from abroad and old and new relations between customers and suppliers can be strengthened. In order to take special care of the export trade, the leading circles have made up their minds that the character of this exposition can be an international one. Thus, they also want to express their strain after a liberation of the international trade.

After detailed deliberations the associations of the trades concerned have chosen the city of Duesseldorf as exposition place

and respective arrangements have already been made. With President Hubert H. A. Sternberg in the chair, the committee comprising all trade associations interested in this exposition called

DRUPA—Internationale Messe Druck und Papier (International Exposition Printing and Paper)

which will be held in Duesseldorf from May 26 to June 10, 1951, has resolved to recommend to the members of the relevant associations to take their exposition measures for 1951 in such a way that all efforts will be concentrated on the DRUPA, the special show for all interested industrial firms, craftsmen, and wholesale-dealers.

The exposition will be held under the protection of the Federal Minister of Economics, Professor Dr. Erhard.

Australian notes

Australian Newsprint Mills Ltd. This company has this year produced 30,472 tons of newsprint, compared to 30,734 tons the past year. A No. 2 paper machine is nearly installed; a test run may be made this month. Joint production of the two machines should begin shortly.

Thomas Owen & Co. Ltd. The firm reports that good progress has been made in the establishment of a mill at Burnie, Tasmania; most heavy shipments have already arrived or are en route. Production at the mill should begin in the second half of the year; vegetable parchment, possibly with body paper purchased from Associated Pulp and Paper Mills Ltd., will be manufactured.

Cuban box plant burned

Cuba's largest corrugated box factory was destroyed by fire on September 30. Although effects of the loss of this mill cannot yet be fully determined, some sources feel the remaining factories in the country could supply Cuba's normal needs if board were available to permit increased box production. However, stocks of board are reported low.

World conditions caused wholesalers and retailers, usually slow buyers in the third quarter of a year, to buy substantial stocks locally; importers placed orders abroad far more heavily than in earlier months. However, by September heavy buying stopped.

A NEW TYPE OF PULP PRODUCTION which the French claim will utilize practically all tropical woods will be tested in two pilot plants now being built in French West Africa. The new process, said to be effective on both hard and soft tropical lumber, may be extended to include production of paper, wallboard and many construction materials if the tests now underway near Abidjan and in the Gabon territory are as successful as anticipated.

PRICES OF MOST PAPER PRODUCTS went up in Hong Kong on October 23, due to an improved demand for paper coupled with depleted stocks. Newsprint on that date was quoted at about HK$1300 a ton, compared with HK$600 in June. (One United States dollar equalled approximately HK-$6.29 on October 23). A paper shortage is developing quickly in Hong Kong, since local buyers placed few indent orders early this year.

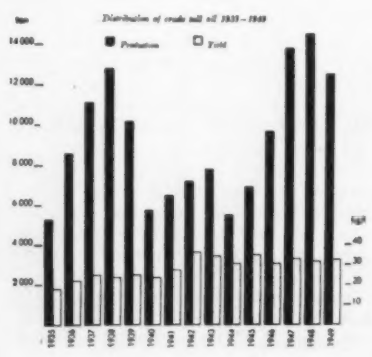
Foreign Abstracts . . . . . .

Statistical survey of by-products of the Finnish kraft industry

The author gives a report on the production, distribution and uses of crude sulphate turpentine, refined sulphate turpentine, crude and distilled tall oil, abietic acid and "tall oil pitch", in Finland during the period 1935-1949. The amount of crude turps in metric tons for export decreased greatly between 1938 (and was almost negligible in 1945). On the other hand, the domestic utilization increased greatly and evidently most (if not all) of this material is used domestically.

Finnish crude sulphate turpentine in 1949 was 3,056 metric tons, and the yield was 7.9 kilograms per ton of pulp (in some previous years this yield was increased to over 9 kilograms per ton). Most of this material is eventually distilled. Beside this nearly 2,000 tons of purified turpentine are produced, most of which is used domestically. Crude tall oil production (in metric tons) in 1949 was 12,450, with an average yield of 32.1 kg. per ton of pulp. Domestic distribution of redistilled tall oil (over 2,000 tons of which was exported in 1949) is fully discussed. Much of it is used in the soap industry, whereas subordinate amounts enter the chemical, textile, leather and varnish industries, and small amounts are used in manufacture of lubricating oils.

Much of the abietic acid produced is exported (1552 metric tons in 1949). Most of the domestic consumption went into the formation of paper size. Tall oil pitch production reached approximately 1030 metric tons in 1949, two-thirds of which was exported. Its distribution in discussed. The author gives nine tables, and eight figures (one of which, on the production and



yields of crude tall oil, is given herewith). T. Lassenius. Tech. Director, Finnish Cellulose Assoc., Helsinfors, *Paper and Timber* 32, No. 4a (Special issue) 22-29 (1950) (Original in Swedish with English summary).

Problems of papermakers of India

The author emphasizes the importance of equipping any new mills in India with the most modern machinery available, and of avoiding old and obsolete equipment. He outlines recent developments in stock preparation units, and different parts of the paper machines, and calls on builders (and owners) to plan thoroughly and to investigate all possibilities before making new installations.

He minimizes the importance of "flexibility" in a paper machine. In general, the more flexible the unit, the lower its efficiency and the greater its installation cost and its requirements in terms of supervision and maintenance. The importance of withstanding foreign competition is stressed. Six references. P. S. Kothari. *Indian Pulp and Paper* 5, No. 1, 73, 75, 77-8 (1950).

Factors determining the quality of wallboard

An important survey of this field. The author systematically reviews in some detail the factors that must be considered in the production of boards made from wood fiber or wood waste. The properties of raw materials which must be dealt with are: the type of wood (or other plant fibers), the rate of growth, the pretreatment (e.g. whether the wood was stored for long periods in water, subjected to river drives, or was dried in air) and the possible action of fungi during storage. The type of wood comminution used (e.g. chipping, shaving, defibering, explosive treatments, with "activation of lignin", etc.) are discussed.

The author also describes the binders or adhesives and impregnating materials used in board production. Of the artificial resins used in Germany, those from urea-formaldehyde are preferred due to lower costs. Impregnating chemicals may serve several purposes: e.g. moisture-proofing, as fungicides or insecticides, and in fire-proofing. (In the author's experience, fire-proofing of board has not been too successful.)

The production and pressing of boards are outlined. Dewatering, molding, and the pressures to be employed are discussed. In Germany, board production entails the use largely of fine chips, formed from solid wood waste. "Dry" fabrication is preferred. The important relationships between board density (and various mechanical properties) and the pressures used in production are discussed. Hardboards require pressures ranging from 427-853 psi. Boards made from wood waste require pressures of 213-569 psi. Fiberboards may be improved by heating (at about 160 C.) *after* pressing. This heat treatment not only "activates" lignin, but appears to cause chemical changes in cellulose and hemicelluloses of the wood. A new technique of board conditioning involves the use of superheated steam.

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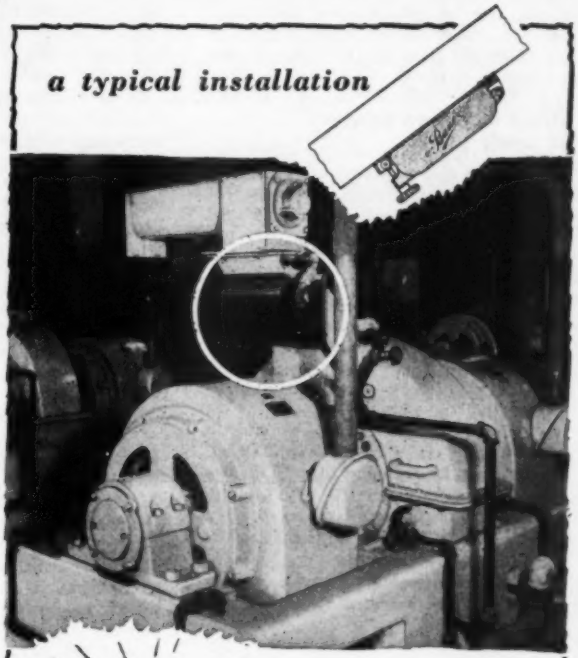

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described briefly. The author gives 18 graphs and 28 references, a number of which are quite recent. Franz Kollmann. *Svensk Papperstidn.* 53, No. 19, 591-604 (1950).

Effect of pH on beating of kraft pulp

The report of a Finnish mill engineer (at Walkiakoski, Valkeakoski) indicates that the *p*H of pulp coming directly from a kraft mill may vary between *p*H 7.5 and 9.0. The *p*H of beaten pulp as it goes on the paper machine is 5.00 to 6.5 (*i.e.* after addition of size and alum). It was therefore possible to carry out beating experiments under very varying conditions of acidity or alkalinity. In order to determine the optimum *p*H for beating (with special reference to power consumption and strength properties of the resulting paper) tests were carried out with both a laboratory Valley beater and a mill-sized jordan. By changing the surface tension of the pulp suspension water, due to the addition of chemicals, the swelling of pulp fibers was affected, with concomitant changes in the rate of beating.

The following conclusions were reached, both from the laboratory and mill tests: rate of beating increased with increasing alkalinity and beating under slightly alkaline conditions caused a marked saving in power consumption. The strength properties of the paper sheet were also slightly better under alkaline beating conditions than when the stock was slightly acid. Evidently the optimum pH was about 8. However strength values of the paper were adversely affected either when a *high* alkalinity *or* acidity, obtained in the beater. Four tables and 16 graphs are given. Erkki Tolvi. *Paper and Timber* (Finland) 32, No. 5, 136-139 (1950). (In Finnish, with English summary).

Oxidation of sulphite pulp in an "after bleach"

Details are given of a study of the oxidation of a rayon (sulphite) pulp in an "after-bleach." (The pulp had received a preliminary bleach in which two chlorinations and neutralizations were used, but details of which are not included.) The starting material had a TAPPI permanganate number of 1.8, had a "Wilson carboxyl content" of 1.65 milliequivalents per 100 g., copper number of 2.1, cupriethylene diamine viscosity in 1% solution of 97.5 centipoises, 89.5% alpha-cellulose and 58.3% (G.E.) brightness. In the "after bleach" at 5% pulp consistency, chlorine dosages (using chlorine water to which sodium hydroxide was added, or hypochlorite solution to which hydrochloric acid had been added) were 0.72, 0.9 and 1.08% of the pulp weight and experiments were run at temperatures of 30, 40 and 50 C. and at *p*H of 2, 4, 6, 8, 10 and 12. The reaction time was so chosen as to allow the chlorine to be consumed almost completely. Oxidation was followed primarily by means of carboxyl and copper number determinations. Viscosity, brightness, alpha content, pentosans and ash content were also determined on the final samples. Details are given in 38 graphs and in an extensive table.

The results (for which the original article must be consulted) are in general agreement with those of other investigators in this field. However, some differences in interpretation exist. For example, in general, the reaction rate *decreases* with *rising* *p*H. This is true within the range *pH* 2-10. At a *p*H of 12, the rate *at the start* of the reaction is actually slower than at *p*H 10. However, as the reaction proceeds, this rate (at *p*H 12) increases and finally accelerates to such an extent that the total reaction time at *p*H 12 is actually shorter than at *p*H 10. 22 references are given. Hannes Sihtola and G. Rurik Gustafsson. *Paper and Timber* (Finland) 32, No. 10, 295-305 (October, 1950) (Original in English).

Barking of small-sized timbers

Barking studies with small-sized timbers (and hardwoods) in a cylindrical barking drum, in a Thorne barker and also in an open barker for batch operation which had originally been developed by the author (Hillbom) for saw log barking. Small models with transparent walls and large scale machines were used in the investigation. Photographs show the condition of dry birch wood and of spruce before and after operation in the Hillbom barker.

Each batch consisted of approximately 20 cubic meters of wood (cut in three meter lengths). The barking period was approximately a half hour, and wood could be used satisfactorily in a kraft cook. With prior soaking in water, the barking period may be considerably shortened, and this is also true when heating is used. Of the three barkers under experiment, the Hillbom machine was most effective for small straight logs but less suited for barking crooked wood. Seven figures are given. Tor Hillbom *Svensk Papperstidn.* 53, No. 17, 522-4 (1950) (Original in Swedish, with German and English summaries).

Lime sorbed by dissolving pulps and its behavior in viscose formation

This is a contribution from the laboratories of the Zellwolle Lenzing Akt. Ges. Lenzing, Austria. Absorption of calcium by pulp from dilute solutions containing calcium ions are due to residual carboxyl groups in the pulp. Equilibrium concentrations for the formation of the calcium salt (of the carboxylic acid) are very small. Even when a dissolving pulp is given an extended washing with water of medium hardness it is sufficient to cause complete saturation of all carboxyl groups. Decalcification of pulps was effected by a 24-hour treatment with N/20 hydrochloric acid, followed by washing with distilled water and drying at 50 C. Spruce sulphite pulp contains approximately twice as much carboxyl as does beech sulphite.

During the mercerizing action with caustic soda most of the calcium diffuses out with the hemicelluloses. An alkali-resistant cellulose prepared by mercerizing a calcium free technical shows only a fraction of the calcium absorptivity of the original pulp. Alpha-cellulose (from spruce sulphite) still retains more carboxyl groups than does beech alpha pulp. Calcium which dissolves with the hemicelluloses during mercerization is chemically bound to the latter.

This complex is precipitated (in part) by alcohol from the caustic solution (obtained from beech sulphite) and contains about one calcium bearing carboxyl group for each 50 sugar units. However, the carboxyl to sugar ratio is higher in that part of the hemicellulose which is not precipitated by alcohol (and which remains in the mother liquors). By dialyzing technical press-liquors obtained by alkaline treatment, the calcium-hemicellulose complex concentrates, and may thus be removed from the recycled liquor. Twenty-five references. Theodor Kleinert and Wilhelm Wincor, *Svensk Papperstidn.* 53, No. 20, 638-43 (1950) (Original in German).

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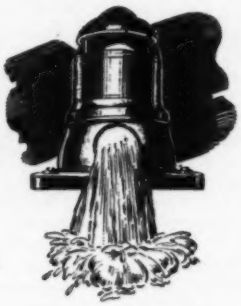

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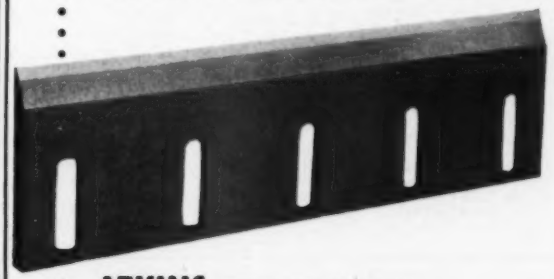

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Convention Papers . . . Abridged

The superintendent's function in research and technical control*

A. E. H. FAIR
President
Alliance Paper Mills

Because of the changes which have been taking place over the years, there has been an evolution in all management functions. The superintendent has probably been affected to a greater degree than other personnel. This general statement applies to all industry, but particularly to pulp and paper.

From the rule of thumb, which suited slow speed conversion of paper, to the present rapid conversion with intricate and temperamental converting machinery has been a long and arduous journey for the papermaker. Changes continue and demands increase. Specifications become more exacting and margins narrow.

This evolution of papermaking prevents a fixed definition of any of the functions of a superintendent. The same individual has a different job today from that of ten years ago. Furthermore, mill size, nature of product, type of organization, as well as personality and special aptitude of the individual are important influences in determining what duties should be assumed by each superintendent.

It can be said without fear of contradiction that the general scope of the superintendent's responsibilities has increased greatly. His relationship to all departments of management also grows in importance. This applies particularly to control and research. Without the active support of the superintendent neither control nor research can be converted into production and profits.

To prove this statement, it is necessary to define control and research. Let us think of control in the broad sense; that is, control of quality, maintenance of production and reduction of waste. Without these three essentials, control is not complete. All are important; and all are essential to successful operation.

Control might be defined as an organized effort to apply acquired knowledge of raw material characteristics and process methods to manufacture a product at the lowest cost, and with the greatest practical uniformity, suitable to meet the use requirements of the customer. This control usually involves prior translation of physical and chemical characteristics into numerical values covering ranges suitable to the guidance of the operator.

Unfortunately, there has developed a term "Control Department," whereas the proper name should be "Testing Department." "Control Department" implies that this department controls quality. This responsibility is rarely the case. In some mills the technical staff do "turn the valves," with the result that the superintendent's responsibility is restricted, and his effectiveness reduced. Generally speaking, however, the controlling of quality, production and efficiency remain the responsibility of the superintendent. Such arrangement seems to have obvious advantages.

Research and control have made available valuable knowledge of basic raw materials. Improved control of raw material quality has made possible the adoption of standard formulas and furnishes, incorporating desirable characteristics of each in proper proportion. Higher average quality resulted. Then followed the increased speeds through reduction of variation of sheet strength and other qualities. Further economies have been accomplished by reduced furnish costs for certain end uses. This would have been impossible without improved control of pulp quality, more intimate knowledge of inherent strength and improved methods of strength development. Improved pulp quality with better control has facilitated sheet design, which is vital to the specialty mill.

But the important fact is that the superintendent has been able to transform this technical knowledge into useful results. It does little good to know the extent of error if we are unable to correct the error. Control is not the knowledge of variance, but the ability to minimize it. The concrete result of control is uniformity of product. It is, therefore, the superintendent who performs the basic function of control—the correction.

So-called technical control takes different forms in different organizations. It is not essential to have a technical staff to have control. In the small mill, the superintendent, or his assistant, may do a satisfactory job without requiring technical assistance. In larger mills, particularly those making high grade pulp or papers, the more elaborate technical department is justified. Here, of course, the duties of the superintendent differ from his duties in smaller mills.

Control has made possible that last ten per cent of efficiency without which success would not have been attained. Such results are relatively easy to measure. They show directly in the statements. The indirect influences, although equally as important, are not as apparent on the surface.

This transition, which has brought faster machines, more intricate and sensitive equipment and instrumentation to the pulp and paper industry, has placed more responsibility on fewer people. Reduction of the relative amount of labor per ton of production has been accompanied by requirement for higher skill and intelligence on the part of employees. Another factor, union organization, has also influenced the viewpoint of both labor and management. More and more, employees are expected to work "with," rather than "for," the man above. The superintendent has been and is the focal point of this important trend, and is af-

(*) Abridged from a paper read before the 31st annual convention of The American Pulp and Paper Mill Superintendents Association, Inc., held at the Edgewater Beach hotel, Chicago, June 8-10, 1950.

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fected by it probably more than anyone else. To handle men, he must practice tact with force. He must administer according to company policy, and he must at the same time retain his individuality. His interdepartmental relations have increased both in number and in importance.

A recent survey showed that the demands on the time, energy and ability of the supervisor in industry generally were roughly: 28% handling people, 26% management and planning, 24% explaining policy, and 22% technical knowledge and effort.

This pattern undoubtedly is close to that of the paper industry. If we assume this to be the case, it is obvious that anything which will facilitate the handling of any one of these functions will assist in the better execution of the others. The superintendent should, therefore, consider the so-called Control Department as a service department to provide him with condensed time saving information in such form as to minimize his time and effort in directing the control of product qualities, production and waste.

The superintendent is no longer concerned about the possible conflict of control with his skills and responsibilities. However, he does have reason to be very much concerned about the dearth of practical papermakers on the way up the ladder. Sometimes I wonder whether the technical side of the business is being stressed too much. There seems to be an almost universal need for the practical training of operators. There will never be a substitute for experience. Unless the obstacles which still interfere with practical training programs are removed, this situation will not improve.

In accepting technical control, the superintendent accepts not only a method, but departments and personalities which differ from his own. This brings us again to his most important function—handling people. He should be tolerant and understanding of other types of people. Weaknesses are easy to find in anyone, but it requires bigness to appreciate the good qualities in a man.

Although there is a similarity between the superintendent's function in control and research, the relation requires separate consideration. The term "research" can be very broad in its implications. Anyone is conducting research if he uses acquired knowledge and ingenuity to develop a new or better method of accomplishing a desired result. Research may be conducted anywhere—in the laboratory, in the mill, in the garage or in the cellar. Every responsible operator should be a researcher. Every person with imagination should have the desire to try something new or to improve what he is already doing. If so, he is a researcher. Certainly the superintendent is no exception. In fact, many an improvement in pulp and paper making has been the brain child of a superintendent. It is well known that any research "pays off" only after the new method has been put into operation on mill scale.

On the other hand, there has been a rather common attitude on the part of mill men in the past to look with a critical eye on products of research. New gadgets and changes in equipment have not always been favorably received. Researchers have sometimes been considered a little queer. However, this attitude has largely disappeared. Progress has been made to the point where the superintendent appreciates that any development which does a better, more uniform job at lower cost can only result in general benefit.

The function of the superintendent in both control and research is to help them, as he must help all departments, and in turn to ask their help, which he will always need. If help is freely rendered, so it will be graciously returned. Here as everywhere, the golden rule applies.

The function of the superintendent in research and technical control may be summarized as follows:

1. To accept both research and control freely as his assistance to better operation, realizing that he himself should be the most important factor in its success.

2. Not to over-estimate its value nor to lean on it too heavily, but to realize it as only one means of making a better product at lower cost.

3. To use the data developed and supplied to the best advantage through translating it to action. In other words, the superintendent's function in control is to do the controlling.

4. To accept the products of research realizing that they are also his tools for better efficiency. To take an interest in research and to supply the practical viewpoint so necessary for its success.

5. To take advantage of the benefits of control by devoting the time and energies he saves to other responsibilities.

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Technical control for paper mills*

ARTHUR J. HAUG
Technical Director
Scott Paper Co.

The purpose of this talk is to cover my concepts and ideas about technical control as it is applied to papermaking and how it results in quality control. Control information and data can be of great help to operations if it is understood by everyone and if it has been realistically developed.

It would be well, at this time, to review the objectives of technical control: (1) improve qualities, (2) greater uniformity, (3) reduced costs. Steps for establishment of quality control: (1) What do you have—analysis of practice, (2) What do you need—analysis of requirement, (3) How can you obtain what you need—control, suppliers, men, machinery and equipment.

The following points are to be covered in this discussion: (1) papermaking raw materials, (2) control of papermaking materials in the process, (3) final product qualities, and (4) insurance of the product's reaching the market in good condition. It is my purpose to explain a method of approach to each one of the points so that pehaps each of you will be able to make some application to your own specific problems.

Papermaking raw materials Of course, wood fibers are our chief raw materials; in order to evaluate these materials it is necessary to have proper facilities and trained personnel. The installation need not be large or pretentious, but it should include pulp testing equipment capable of giving reproducible results.

Extensive testing of all pulp and waste must be carried out to find out "what we have." First, all tests should be run on each shipment or lot of pulp, and records carefully kept. In mills where furnish consists of a single pulp, the job is finished. Where furnish consists of a blend of two or more pulps, this same pulp testing should be performed on samples collected before any beating or refining is done.

"What do you need?" is going to be different for each and every one of you, even for mills making the same product. Here it is necessary to take the pulp and furnish data and use it in conjunction with machine operations, with finishing operations and with final product qualities. The study of these data is a complex task; it should be done by some one person or a group who knows pulps, operation and quality objectives.

Having established which pulp qualities are important for your process and product, then effort should be made to obtain fibrous raw materials which satisfy those requirements. "What you need" can be obtained by working intelligently together with your suppliers. A similar testing procedure should be carried out as far as possible with other raw materials you use in your process.

Process control The next phase of our discussion involves raw materials as they are put into the process, and follows them through the paper machine. We must find "what we have," through a testing program. At first, it is necessary to take many tests at many locations to form the basis for the system which eventually will prove of value.

As a result of the previous investigations, information concerning the furnish is available. Important information may result on sampling after beating, after refining, in the headbox or in the vat. Consistency of the stock, its freeness, *p*H, strength or fiber length are some suggested tests. There are perhaps others which might prove useful for your specific case.

Establish which test or tests in which location have the most direct bearing on machine operation and finished product qualities. After these trends have been established we again have to answer "What do we need?"

Obtaining what we need, in this case, is up to the operating group backed by the Technical Department and the Engineering Department, since they are the ones who affect the raw materials in the system.

It is wise, I believe, to have a group independent of production to make all tests. In this way, objective results and decisions are more certain.

In order to meet the desired range as measured by process data, engineering studies of machinery and equipment may be necessary. Swings in process data may be explained only after detailed study of stock flows, white water balances and equipment performance. When this shifting takes place, there must be an explainable reason. The reason, when uncovered, often results in improvement in the operation.

Final product qualities Just how product quality standards are set varies considerably. The object, of course, is to have these guides result in products which satisfy the consumers. It is fundamental, yet rather unique in the industry, to make products which satisfy the consumer rather than products which can be made most conveniently and most economically. On the other hand, it is imprudent to set goals which are not possible to attain.

Establishment in a mill of new quality goals calls for team work on the part of the entire group. It is necessary to review furnish data, to make use of process data, and to educate all operating personnel thoroughly as to the problems.

Records kept carefully for each measured quality for each paper machine form data invaluable as reference material to review the current operation. Also, you would be surprised how often a record of the performance of a machine a month ago, or even a year ago, may prove of value.

Shipping of products For some of you, concern for the final product may not be too great a point since your output will be fabricated into a final consumer product. However, you know the waste which can result in a smashed edge of a large roll, or crushed flutes of a corrugated board or a puncture many thicknesses deep into the surface of a roll.

Program development for cartons, shipping containers, or whatever protective carrying medium you use, follows exactly the same lines we have followed up to this point. From such a study, specifications for such

(*) Abridged from a paper read before the May 5-6, 1950, meeting of the Pennsylvania-New Jersey-Delaware Division of the American Pulp and paper Mill Superintendents Association, Inc., held at York, Pa.

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items are set up by the Materials Control branch of Technical Control. It is important to work with suppliers in considering these specifications. A co-operative effort always brings satisfactory results more quickly. Many times an educational program is needed to insure a successful conclusion to your product's journey.

At Scott Paper Co., we very firmly believe in the system and practice it religiously. And we believe that it has been of great benefit. That it represents the answer 100 per cent of the time is not true. Papermaking still retains some very stubborn and cantankerous streaks which strongly resist being tagged with a number or a figure. It is true, though, that many problems are licked more quickly by application and use of the data.

It would be amiss to conclude without a word regarding the type of program just discussed. It is to be emphasized that the data become useful when values which are the exception result. Practically the same data will result day after day when things are running smoothly. When values which differ from this pattern are obtained, then the source or point of abnormality can be found more quickly.

What we have learned about diesel engines*

S. E. TOMCZAK
Plant Engineer
Kansas City Star Co.

The Flambeau Paper Division of The Kansas City Star Co. is located on the Flambeau River at Park Falls, Wis. The plant consists of a 100 ton bleached sulphite mill, a 50 ton groundwood pulp mill and two paper machines. Our generated power is principally hydroelectric. Supplementing the three hydroelectric plants, we have a steam turbine generator and two diesel driven generators.

The diesels are Fairbanks-Morse Model 38D 8⅛, ten cylinder opposed piston type. Our diesels are direct connected to generators, operated at 720 rpm; at that speed, they are rated at 1600 hp. At 800 rpm the rating is 1800 hp. The principal auxiliaries are: air blower, circulating pumps for cooling, and heat exchangers. The air blower has a capacity of 6800 cfm; at three psi delivery it requires 162 hp.

The jacket cooling water is circulated through a heat exchanger. Engine temperatures are maintained by a thermostatic control that by-passes jacket water around the heat exchanger.

The pump for cooling water for the heat exchanger has a capacity of 650 gpm. The amount actually used varies with the season.

The cooling water is piped from the filtered water supply main right after the filter plant. This water is under 70 psi as it enters the suction side of the circulating pump. The pump boosts the pressure up to 92 psi. This boost in pressure enables us to return the water, which has picked up some heat in its passage through the heat exchanger, back into our mill supply water system. There is no wasted water and the heat recovered results in a direct saving of fuel required for heating our process water.

The lubricating oil circulating at the rate of 300 gpm is cooled by a similar heat exchanger and cooling water supply.

Operating data and costs—Our No. 2 diesel is located a considerable distance from our central control. Therefore, it is necessary to have an operator on each shift. The following data and cost figures cover the No. 2 installation for the year of 1949:

Gallons fuel oil used	257,357
Average cost per gallon	13.16c
kw-hr produced	3,439,349
kw-hr per gallon fuel oil	13.3
Cost per kw-hr	1.37c

The cost figures for the No. 2 diesel cover all predetermined and controllable expense. They also include some extraordinary replacements, as that unit, as well as No. 1, was in Navy service for about 2 years.

Our No. 1 diesel is located near our center control room. It does not require extra operators. Predetermined and controllable costs for it are identically the same as on No. 2. The elimination of an operator on each shift, however, brings its cost down to .01232.

Maintenance work on diesels—The life of the cylinder liners, excluding accidental cracks, is approximately 15,000 hours. Accidental cracking of cylinders is due principally to failure of cooling water supply.

Our diesels are shut down periodically for

(*) Abridged from a paper read before the 31st annual convention of The American Pulp and Paper Mill Superintendents Association, Inc., held at the Edgewater Beach hotel, Chicago, June 8-10, 1950.

Valuable data for you
regarding
R·C
Vacuum
Pumps

Roots-Connersville Rotary Positive Vacuum Pumps have been used successfully in paper mills for many years—including couch rolls, press rolls, flat boxes and felt conditioners. Their high efficiencies and low power costs, which have gained and held wide trade acceptance, have been enhanced in the modern designs now offered, including both single and compound units.

Valuable data, such as characteristic curves, are contained in Bulletin 50-B-13, which is yours for the asking. This bulletin also discusses our Centrifugal units, which are designed for operation in central vacuum systems.

ROOTS-CONNERSVILLE BLOWER CORPORATION
101 Monroe Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE
BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

One of the Men behind Eastwood Wires

Charles Worzel

—A "Weigh" to Better Wires

Responsible for weighing up metals for our melting furnaces, Charles Worzel knows that upon his accuracy depends the fine quality of our fourdrinier wires.

The base of the alloys is determined by the precise proportion of copper, tin and phosphor copper that go into making the phosphor bronze wires, and of copper and zinc that make up our brass wires.

A chemical analysis of each heat is made in our own laboratory.

The constant, complete control of our alloys is additional assurance of the high qualities of Eastwood Fourdrinier Wires and Wire Cloth.

EASTWOOD-NEALLEY CORPORATION • Belleville, N. J.

inspection and servicing. If a machine has new rings, we shut it down about every six weeks to clean the ports and upper header (air intake). The carbon deposit that collects at these parts is due to some oil getting by the rings, and also oil from the blower. To remove the deposit requires two hours time with a crew of three men.

As the rings get worn, the interval between cleanings is lessened; with badly worn rings, it is three weeks. The time between clean-ups also is influenced by the load carried and by the quality of fuel and lube oil.

About every 8,000 to 12,000 hours, we check bearings, liners, piston rings, pistons, wrist pins, bushings, timing chains and other parts that may need attention. This job requires five to six days with a crew of four men working eight hours a day. It takes about two days of this time to clean the pistons. We usually change all the rings at this time. If the liners are worn appreciably, it is advisable, and it pays well, to change the upper compression and the lower oil ring more often.

Our experience with diesels indicates that they earn their keep. They enable us to save stored water for future use. The storing of water in the spring allows us to increase the stream flow during the hot summer months. This practice improves the condition of the stream which naturally is worse during the hot weather due to low oxygen content. Coupled with the reduced oxygen content is pollution from the city and from industry wastes. The diesels also replace former purchased power which, in our case, amounts to a pay back of about two for one.

Some phases of wide-roll high-speed supercalendering*

DALE SHERMAN
Calender Superintendent
St. Regis Paper Co.

Every mill has its problems in making paper on a papermachine. Also, every mill with supercalenders has its problems in supering.

No two mills with the same equipment obtain exactly the same results. Invariably, the good qualities of a sheet of paper are brought out more than ever by supering. Also, supering brings out all of the undesirable qualities.

For instance, supering makes wire ridges larger than ever. It also blackens wet streaks, and makes an over crushed appearance much more noticeable. Likewise, light streaks in a sheet are brought out prominently as undesirable corrugations. Then, too, hard end reels make shipping rolls that slip easily; and the outside ends are harder than ever.

Supercalendered paper can be no better than the base paper from which it is made. It is merely a further processing of the paper, just as is printing.

Two very important factors in good supering are moisture content and evenness of weight across the sheet.

In large supers, those calendars that take a web of 100 in. or more, resupering for low finish is nearly impossible, unless it is on the heavier grades of paper. When trying to hold production with a papermachine and staying cought up to it, the time for resupering does not exist. The sheet already has lost some of its life and is very hard to handle under pressure.

A sheet that is uneven in weight across the web immediately shows up in poor mechanical rolls. Ridges, corrugations, and hard and soft spots in the shipping rolls mean trouble in the press rooms.

A Glens Falls laboratory gloss meter is mounted on each super-calender in the Deferiet mill of St. Regis. This instrument gives a finish reading on both sides of the supered sheet, just before winding up on a spool to go to the rewinder. Such information is of great help to an operator who, in operating a stack, is trying to keep the finish uniform, both with the reel running and from reel to reel.

Adjustments have to be made only on grade changes. A calender will hold an adjustment indefinitely if not disturbed or if no major change is made in the sheet.

Connected to each gloss meter, also mounted on each super, is a Bailey recorder. This recorder has a 24-hour dial chart. It records both finish averages and down time. Down time may be caused by a breakdown and consequent need for repairs, or because of a necessary wait for paper to come from the paper machines.

The supers at Deferiet run at speeds up to 1700 fpm. When the supers are running ahead of the paper machine, this speed is cut down to lengthen roll life in case of a break in the filled rolls.

An attempt is made to maintain 1200 to 1400 pounds pressure per linear inch on the face of the bottom rolls. This pressure will vary with the various grades of paper made.

We have to be able to super paper ranging in weight from 35 pound to 85 pound on the same super without a change in rolls or without making any major changes in the supering process.

The type of filled rolls used for supering has to be determined by trial. We have settled on No. 3 Filmat filling for our rolls. These rolls not only give good results over our wide range of papers but also give us very good roll life.

We use two steam showers on each side of the paper. These showers are located fairly high up on the super so that the sheet has several nips to be worked on after receiving the steam. The control for the steam is located so that the operator can reach it easily to make adjustments. It is the only operational device on each of the supers that can be varied quickly so as to follow changes as shown by the individual gloss meter.

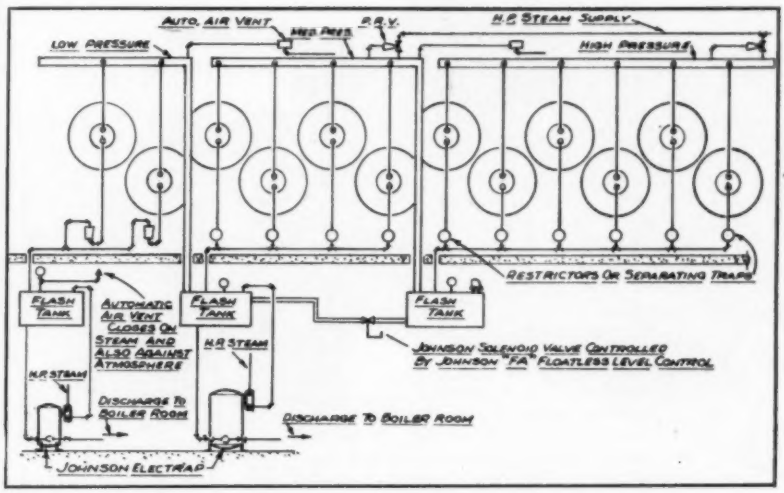
The use of supers large enough to take full reels from the paper machines means smaller operating costs because of greater production. Also, in the operation of a large super, it is possible to notice quickly any changes in the paper and thus be in a position to adjust both the paper machine and the super to get better uniformity.

(*) Abridged from a paper read before the 31st annual convention of The American Pulp and Paper Mill Superintendents, Inc., held at the Edgewater Beach hotel, Chicago, June 8-10, 1950.

Newsprint from mulberry

Studies were made to test the suitability of paper mulberry (*Broussonetia papyrifera*) as a raw material in newsprint manufacture. The work was done at the Forest Research Institute (Dehra Dun, India) and the experiments are described (1 printed sample sheet is included in the article). The mulberry newsprint compared favorably with imported paper, and was actually superior in its color and printability. The author believes that paper mulberry must be considered a promising raw material for news. Six tables, two illustrations, and four references are given. Chattar Singh. *Cellulose and Paper* (New Series) *Indian Forest Bull.* No. 143, 1950 (14 pages).

The Paper Industry New Products



Paper Machine Drainage System

Uses electric method of operation.

The "Electrap," an electrically operated pumping trap at the wet end of the paper machine, is the outstanding feature of this drainage system designed for paper machines which have dryer rolls divided into the usual three groups using steam at successively lower temperatures. In the new system, two "Electraps" are used in place of the usual centrifugal pump and condenser to return final condensate to the boiler room.

High pressure steam is admitted to each "Electrap" during operating cycles, to force condensate back to the boiler room. This steam used for pumping is then utilized to heat rolls or to improve drainage; hence the only pumping cost is the electrical current used by the solenoid valves which control operation, and a slight radiation loss. There are no floats, bells or stuffing boxes in or on the drainage chamber. Motionless electrodes control an electric circuit, through a relay, which actuates the solenoid valve to admit steam during pumping cycles or vent pressure when the trap is filling. Johnson Corp., Three Rivers, Mich.

Motorless Sweeper

Sweeps and gathers dirt in one operation.

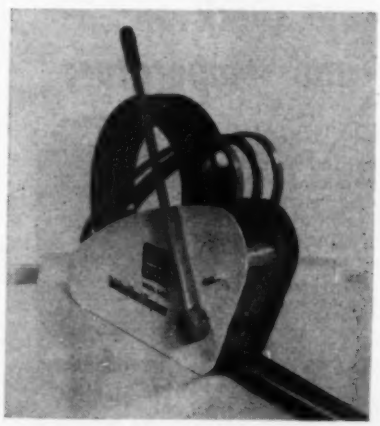
The "Plantman" sweeper replaces the push broom and dustpan with an unpowered machine which sweeps an area 20 inches wide and collects dirt at the same time. The device is said to be five times faster than hand methods of sweeping, and savings in time and dollars have been shown to be as high as 87 per cent.

The sweeper weighs 48 pounds and has six brushes of different thicknesses of fiber. These can be adjusted to compensate for 1½ inches of wear before new bristles must be installed.

The "Plantman" is suitable for large or small areas, and has a rotating brush attachment which cleans up to the walls. It will collect standings, tin, trash, and sizeable scraps of wood, metal and paper. Handling Devices Co., 581 Boylston St., Boston 16, Mass.

Dispenser for Shipping Bands

Stationary and portable models



For speedy cutting of cut-to-length strapping for shipping containers, this new dispenser handles one or two coils of Acme "Unit-Load Band" and cuts them in a single downstroke. Any two-coil combination of ¾-inch, 1¼-inch or 2-inch band in all thicknesses can be handled. An attachment for handling ⅜-inch band is also available. Construction of the dispenser features tool steel shear blades and a 30-inch hand lever. The portable model is equipped with a towing handle, hooded rubber casters, and a positioning brake. Acme Steel Co., Dept. PX, 2840 Archer Ave., Chicago 8, Ill.

Shop-Assembled Boiler

Reduces installation work, saves time.

The "Integral-Furnace Boiler, Type FM," is completely assembled and shipped as a unit. It can be used singly in small establishments, or in combinations of two or more in larger plants having few skilled boiler operators. It is a water-tube boiler, with a completely water-cooled furnace. Simple to install, it can be set on a concrete floor or concrete corner blocks. Operation is by push-button start and stop and automatic control for handling variations in loads. Maintenance is said to be almost eliminated. Firing may be by oil, gas, or combination oil and gas. Changeover from one fuel to another is easily made. Standard sizes, for loads ranging from 7000 to 25,000 lb. of steam per hr., at pressures up to 250 psi. The Babcock & Wilcox Co., 85 Liberty St., New York 6, N.Y.

Nonionic Detergent

A solid surface active agent

These detergents, commercially named "Pluronics," are a further development of nonionic detergents which have been previously marketed only in the form of liquids or pastes. By using a hydrophobic unit not previously used in detergent manufacture, it is now possible to produce a solid nonionic. A wide variety of 100 per cent active nonionic detergents can now be made. Particularly effective in hard water areas, it is expected that "Pluronics" will increase efficiency in commercial laundries and textile mills. Each product in the series is available in pilot plant quantities and will soon be manufactured commercially. Wyandotte Chemicals Corp., Development Dept., Wyandotte, Mich.

Electronic Instruments

Strip-chart models for single or multiple records.

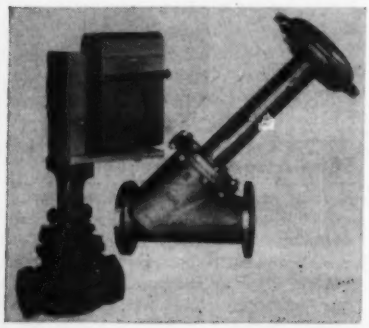
This new line of strip-chart electronic instruments is known as the Series 500 Strip-Chart Dynamaster. The Dynamaster is a high-speed, self-balancing AC bridge designed for measurement of temperature, resistance, conductivity, strain, position, inductance, pressure, force, or any other variable which can be measured in terms of impedance. In addition, the instrument can be used for electric power totalization and as the receiver for this company's Metameter system of Telemetering.

The measured variable is recorded on a chart 11¼ in. wide and indicated on a large

scale which is legible at a distance. Models for as many as 16 different records are available. Supplementing the strip-chart recording instruments is a line of controllers, including both electric-operated types and Free-Vane pneumatic types. The Bristol Co., Waterbury 20, Conn.

Control Valves

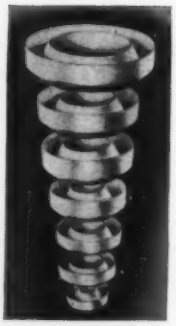
Made of corrosion-resistant alloys.



Hasco valves are now being furnished with pneumatically operated or electrically operated topworks for remote operation. These valves are available in the globe, "Y" and angle patterns. They are also furnished as single and double seated control valves. The line is available in the following corrosion-resistant materials: KA2SMO stainless steel, Hastelloy, nickel, monel and Illium. Hasco Valve and Machine Co., 1263 N. 70th St., Milwaukee 13, Wis.

Frictionless Packings

Permanent sealing.



This series of "V-Ring" type packings is molded of pure Teflon, a chemically inert and frictionless material that enables the rings to insure a permanent seal at temperatures up to 450 degrees F. It is also said that they last several times longer than conventional packings, and that they form a perfect seal with finger-tight pressure on the gland. The rings are of particular interest to the chemical field and to valve manufacturers. They are part of this company's line of "Chemlon" packings. Crane Packing Co., Dept. P-2, 1800 Cuyler Ave., Chicago 13, Ill.

Ratio Totalizer

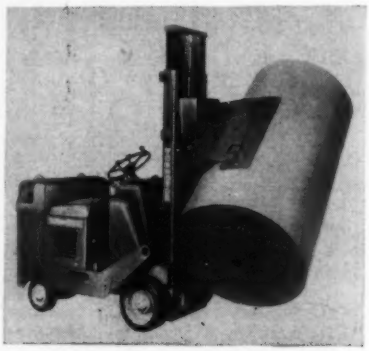
Sensitive to changes in input loadings.

The Hagan Ratio Totalizer is a pneumatically operated control mechanism for accurately combining input control pressures and spring forces in any desired manner to produce a single output control pressure. It can accommodate as many as three input loading pressures plus three spring forces in a single unit. It is designed for use in computing circuits for such functions as addition, subtraction, multiplication, and division of control signals, and in control circuits for introducing proportional band action, rate action or automatic reset, either separately or in any desired combination.

An adjustable fulcrum allows broad adjustment of output loading pressure, which may be in the ranges of 3-15 lb., 0-30 lb., or 0-60 lb. Frictionless construction assures sustained accuracy and freedom from maintenance troubles. Hagen Corp., Pittsburgh, Pa.

Paper Roll Clamp

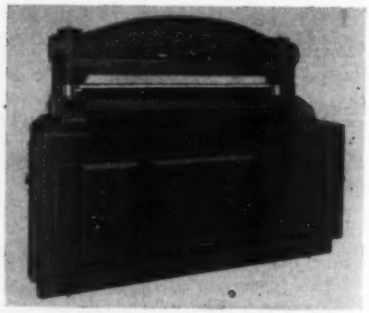
Rotates roll 360 degrees in either direction.



For rapid handling of rolls of paper, this clamp features complete rotation of a roll weighing up to 2800 lb. with minimum width of 32 in. and diameters ranging from 30 to 44 in. The attachment consists of one stationary arm and one hydraulically-operated arm which moves laterally from the fully closed position of 29 in. to the fully opened position of 45 in. between the pivoted clamping shoes. Opening and closing of the clamp is controlled by a valve placed beside the operator. Designed primarily for handling newsprint rolls in and out of box cars and storage areas, the clamp is also suitable for handling other types of paper rolls and cylindrical objetcs. Towmotor Corp., Cleveland, O.

Guillotine Cutter

Will cut up to 48 inches

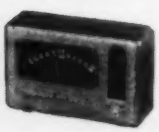


The model 4M-48 can be used on most products of the paperboard, plastics, and rubber industries where sheet or slab stock must be cut. It will cut off stock up to 48 inches wide with thicknesses up to 1¾ inches. A one-revolution clutch arrangement, operated through a solenoid trip mechanism, is adaptable to various types of electrically

for maximum QUALITY... as well as QUANTITY...

...keep an accurate check on relative humidity and temperature

Keeping posted on temperature and relative humidity is just common sense in the paper industry. These two vital factors affect not only the output of your plant and machinery, but also play an important part in determining the quality of the finished product. Be sure of the proper combination of temperature and relative humidity in your plant . . . insist on Bendix-Friez instruments for unparalleled precision and economy in this type of work.



BENDIX-FRIEZ

Hygrodial

Model 185

Precision Humidity and Temperature Indicator

Hair-operated and calibrated to professional standards of accuracy by the maker of the world's finest weather instruments. Handsome, modern case —4" high, 5½" wide, 1⅝" deep.

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Model 160

Portable Humidity and Temperature Recorder

3" x 5" charts, 10 or 30 hour records. Modern design . . . handy for small space and difficult locations . . . built to meet unusual conditions.

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World's finest heavy-duty traveling wheel grinder for high speed grinding with extreme accuracy and efficiency. Fully equipped to your own specified requirements. Can be furnished in either built-in motor drive or V-belt drive.

Widely used for paper, planer, hog, barker, chipper, and veneer knives. AK grinds flat or concave bevel on any desired angle or square edge. Built in lengths from 84" to 350" and longer when required.

Write for complete data PI-11

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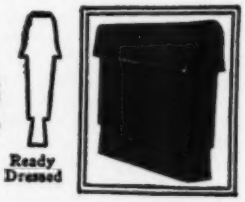
"READY DRESSED" **MILL COGS**

LABOR SAVING — TIME SAVING

The Most Economical Filling That Can Be Put in a Mortise Wheel.



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MADE BY

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From the elaborate quill entry-maker of our Colonial fathers to milady's chic fountain pen! By way of parallel: the mighty progress research has brought to the manufacture of Fourdrinier wires and paper. Lindsay takes pride in the contributions it has made in these fields.

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. . . that's what the Jumbo Posters are. These giant-sized billboard displays measure 11 feet 8 inches wide by 9 feet 11 inches high . . . so BIG they can't be missed!

Many people in your plant aren't aware of some of your most important safety work—essential measures not apparent to the eye. Everybody, on the other hand, can see and understand Jumbo Posters. They are an effective way of reminding your associates—from the president down to the office boy—that safety is a live-and-going concern in your plant.

Jumbo Posters are good public relations, too. Set out in front of your plant, they tell everyone in your community—the residents and the passersby—that yours is a safety-minded company, interested in the welfare of your workers.

Let Jumbo Posters add showmanship to your plant safety and public relations programs. Write today for free illustrated catalog.

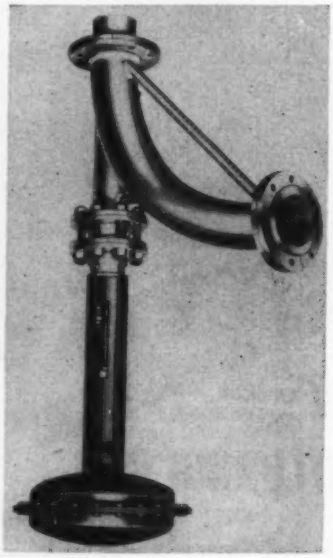
NATIONAL SAFETY COUNCIL

425 N. Michigan Ave., CHICAGO 11

operated tripping devices and will produce cuts ranging from ¼ inch up. Construction is of steel weldment supporting a heavy cast meehanite cutting block. A 4 hp., 1200 rpm. motor drives a heavy cast flywheel which in turn drives the main shaft of the machine, operating the knife carriage. Black Rock Mfg. Co., Bridgeport, Conn.

Angle Valves

Streamlined for minimum flow resistance.



The 7000S "Flo-Tested" long sweep angle valves are available in angle design only and are designed for minimum turbulence in the flow through the valve and for use on slurry service where the solids in suspension tend to plug the conventional type control valve.

Design features include an extra-long plug guide, high lift valve plugs, and seat designed as a section of a Venutri throat. Retained seats are not threaded and there is no possibility of cutting out between the seat and the body. Because the body has the same cross section as the connecting line, the maximum seat size is ½ the nominal pipe area. The maximum valve capacity is therefore 50 per cent of the corresponding Venturiflo type valve.

Sizes range from 2 inches to 6 inches. Bodies are of stainless steels or can be supplied in any alloy that can be bent and welded. Hammel-Dahl Co., 243 Richmond St., Providence 3, R.I.

Glycerin Substitute

A lubricant for paper manufacture.

A synthetic known as "Aquaresin" is being used to replace glycerin when the latter is scare, in such processes as softening and plasticizing glue and water soluble gums and gelatin, and where a lubricant and softener is needed in the textile and paper industries. The product is odorless, viscous, colorless, non-drying, and hygroscopic. The *p*H of its 5 per cent aqueous dispersion is 8-8.4. It is soluble in water, methanol, glucerin and glycols; insoluble in oils and hydro-carbons. Available in 55-gallon drums. Glyco Products Co., Inc., Brooklyn, N.Y. and Natrium, W. Va.

New Product Briefs . . .

▶ TUBE FLARING TOOL—The model 410 features new design elements: split die blocks hardened for longer wear, a black wrinkle protective coating to give a positive gripping service, a longer flaring pin point to handle heavy-wall tubing, a self-aligning vise screw nose, and a sliding type vise handle. A hand tool, for use on ¼, 5/16, ⅜, ½, and ⅝ inch tubing. Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, O.

▶ ELECTRIC LIFT TRUCK—Improved design of the Marforge "Load-Mobile" increases maneuverability and stability, and provides easier accessibility to electrical equipment and auxiliary equipment such as the lifting ram and the hydraulic pump used for lifting. Available as a lift truck for skids, a pallet truck, a freight pick-up truck, and a tractor. Market Forge Co., Everett, Mass.

▶ WIRE CONNECTOR—The "Ideal Set Screw Wire Connector" uses no solder, tape or special tools. Underwriters' Laboratories approved for 600-volt application, it consists of a set screw sleeve and a phenolic shell, both made of solid brass. For use on conduit, armored cable, non-metallic cable and open wiring needing complete protection against flash-overs. In two sizes. Ideal Industries, Inc., 4162 Park Ave., Sycamore, Ill.

▶ VISCOMETER ADAPTER—This "UL Adapter" for the LV Model Viscometer makes possible extremely precise measurements in ultra-low viscosity ranges. Because of a special amplifying effect, when measuring viscosities within the range of 0 to 10 centipoises, reproducibility within .02 centipoises is obtainable. Brookfield Engineering Laboratories, Stoughton, Mass.

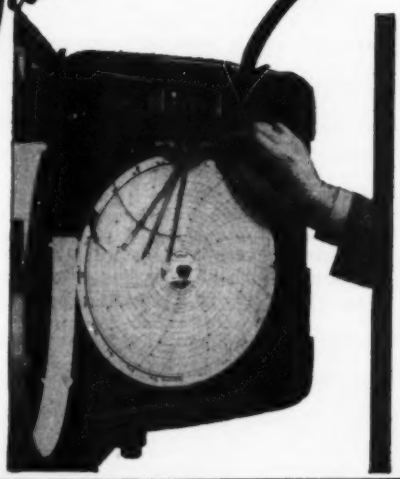
▶ HEAVY DUTY FORK TRUCKS—The "Type FT" center-control fork truck is designed to handle 5000 and 6000 lb. loads safely and economically. An exclusive motor is said to have 25 per cent more power than other motors of the same size and weight, thus providing economy of operation. Wheelbase dimension, 48 inches; width over drive wheels, 39¼ inches. Baker Industrial Truck Div., Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, O.

▶ POWER DRIVES—This company's line of "Speed-Trol" motors are now available in the single phase capacitor type design. A newly designed starting relay eliminates the need of centrifugal switches or rotating devices. Available in ½ to 3 hp., with 18 different maximum speeds from 2000 to 52 rpm. Sterling Electric Motors, Inc., Los Angeles 22, Cal.

▶ RUBBER TIRES—A new demountable cushion-style rubber tire will be standard equipment on the models 1015 and 1024 gas Trucloader fork-lift trucks, the model 1024 electric Trucloader, and on the Clarkette-5 towing tractor of this company. Other models will have the new tires later. The demountable tires reduce tire-changing time from several hours to 15 minutes, and wear as well as the pressed-on tires formerly used. Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

Accurate Consistency Regulation which can be CHANGED by just a turn of a knob

BRAMMER *recording consistency control*



Maintains accurate, 24-hour chart of stock consistencies . . . recording regulated consistency and indicating consistency of unregulated stock entering flow box.

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The Paper Industry New Literature

Books

FOREST PRODUCTS. By Nelson C. Brown. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N.Y. 399 pages. 5⅜ x 8⅜. $5.00.

Working from the basic assumption that wood is the raw material of the future, since it may be converted into such a wide variety of products essential to modern life, Mr. Nelson discusses recently-developed uses—such as rayon, wood sugars, plastic and clothing—for wood pulp, and comments upon the importance of many older products. Stressing the recent trend to utilize many materials wasted until recently—bark, sawdust, shavings, liquors—the book suggests many ways in which such wastes may be turned into profitable materials.

Each of the eight sections of the book was checked by a competent authority before publication. Chapter 22, Wood Pulp and its Products, which is part of Section II, "Chemically Derived Products," devotes some 34 pages to a history of paper, various means of pulp processing, geographic distribution of such production—and recent developments in each of several pulpwood producing regions—with several tables and illustrations. Additionally, this chapter includes a summary of the methods by which pulp is converted into paper, and discusses several important pulp-based products, such as rayon and plastic, other than paper.

A MANUAL OF PLASTICS AND RESINS IN ENCYCLOPEDIA FORM. Edited by William Schack. Published by The Chemical Publishing Co., Inc., 26 Court St., Brooklyn, N.Y. 547 pages. 9 x 6½. $10.00.

More than 1500 materials, processes, products, and equipments of the plastics industry are listed alphabetically in this volume. Many of the more important terms included are discussed in lengthy articles; other subjects receive less space, as their complexity and importance decree.

Fully cross-referenced, indexed, and illustrated with numerous sketches and diagrams, the book was planned to be used in the same manner as is a dictionary. Three appendixes —trade names, fabrication charts, and charts showing comparative prices and properties of various plastics—are included.

A PRIMER OF ENGRAVING AND PRINTING. By Harry Appleton Groesbeck, Jr. Published by Colton Press, Inc., 468 Fourth Ave., New York 16, N.Y. 4¾ x 7. 174 pages. $2.50.

This volume, which is written to give the beginner in the graphic arts a basic understanding of techniques and mechanics of graphic reproduction, will be of value to more experienced workers in the graphic arts as a quick review of fundamental processes. After opening the book with four chapters which explain the theory of reproduction by letterpress, lithography and gravure, the author devotes four chapters to an extensive discussion of photoengraving. Another chapter concerns itself with the choice of the best printing process for specific jobs.

Together with a chapter on ink and its selection, a chapter on pulp and paper production completes the entire picture of printing presented by the book. Discussing kinds of pulp and their sources, the author discusses how cooking, beating, sizing, coating and calendering of paper effects the printed sheet. Data is given on sizes and weights of most commonly used paper grades. The volume is competently cross-indexed.

Booklets and Pamphlets

HOW PAPER IS MADE AT KVP. Published by Kalamazoo Vegetable Parchment Co., Parchment, Mich. 13 pages. 7¾ x 5¼. Planned for distribution to KVP plant visitors, this booklet summarizes pulp and paper production in non-technical fashion suitable for the layman. Simple diagrams of the manufacture of pulp and paper are included, as are numerous photos of mill equipment.

AMERICA'S STRENGTH GROWS IN HER FORESTS. Published by American Forest Products Industries, Inc., 1319 18th St., N.W., Washington 6, D.C. 8 pages. Planned for use with the booklet "Trees for Tomorrow," this teacher's manual is an aid to teaching an introduction to forestry in elementary and high schools. It outlines the "Trees for Tomorrow" text, and includes a helpful introduction, suggestions for class activities, and suggested discussion objectives.

SAFETY . . . A CORNERSTONE OF SECURITY. Published by Kimberly-Clark Corp., Neenah, Wis. 10 pages. A copy of the booklet is being sent to each registrant at the National Safety Council Congress held last fall; a limited number of additional copies are available free of charge. The booklet, published in answer to the request of many Congress attendees, is a reprint of the keynote address of Kimberly-Clark's president, Cola G. Parker, which was the opening feature of the Pulp and Paper Section of the Congress.

CELLULOSE AND PAPER (NEW SERIES) interim report on the manufacture of newsprint from paper mulberry (broussonetia papyrifera). Indian Forest Bulletin No. 143. Published by The Forest Research Institute, Dehra Dun, India. Rs. 1/-1- or 1s. 6d. 14 pages and specimen sheet of newspaper. This bulletin describes the details of the investigation on the suitability of paper mulberry for the manufacture of newsprint which were carried out at the Forest Research Institute. Newsprint from this material was made on a commercial scale and used for a special edition of a newspaper. Procedures and results of the experiment are detailed.

UNITED STATES CIVIL DEFENSE. Published by National Security Resources Board, Washington, D. C. 162 pages. 25c. In three parts comprising 27 chapters, this booklet is a reprint of the plan submitted to President Truman by the Board for complete civil defense of the United States in case of foreign attack. The appendix includes suggested models for state and local defense and a bill recommended for a federal civil defense law.

FEDERAL GOVERNMENT PROCUREMENT ACTIVITIES. Brochure published by Government Procurement Reporter, P. O. Box 150, Long Island City 1, New York. The booklet describes the "what, where and how" of procurement activities, and suggests proper procedures in gaining government contracts.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.

Labeling Methods. Polymer Industries, Inc., 284 Sheffield Ave., Brooklyn 7, N.Y.—This leaflet, titled "Made for Each Other," discusses difficult labeling problems arising in high-speed operations and with use of unusual label stock or unusual surfaces. Use of the New Jersey Pony Labelrite machines is emphasized, as well as other types of labeling machines. Recommendations are made for adhesives and techniques to solve particular problems.

Boiler. Babcock & Wilcox Co., 85 Liberty St., New York 6, N.Y.—G-72, a 12-page bulletin, describes the integral-furnace boiler, Type FM, which is completely shop-assembled. Pictures and diagrams illustrate operation and construction. Capacities, dimensions and shipping weights are included.

Pressure Filter. Oliver United Filters, Inc., 33 W. 42nd St., New York 18, N.Y.—Bulletin No. 144 brings information up to date on the well-known Sweetland pressure filter. Many applications are listed as well as structural details of the different sizes. Detail photographs of such features as sight glasses and sluicing mechanism are included.

Transformers. Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa.—Booklet B-4428, 28 pages, is entitled "Westinghouse

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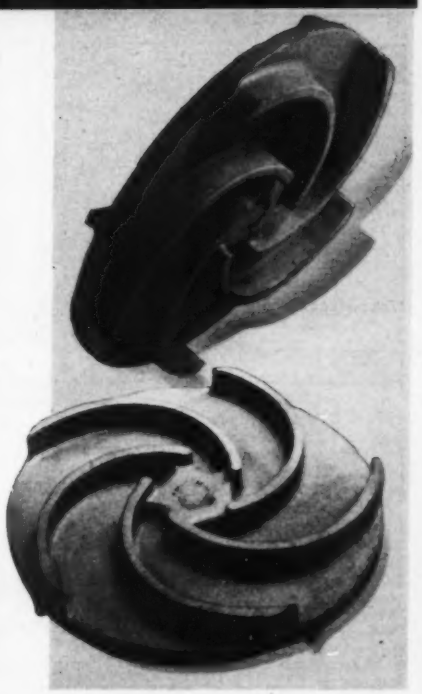

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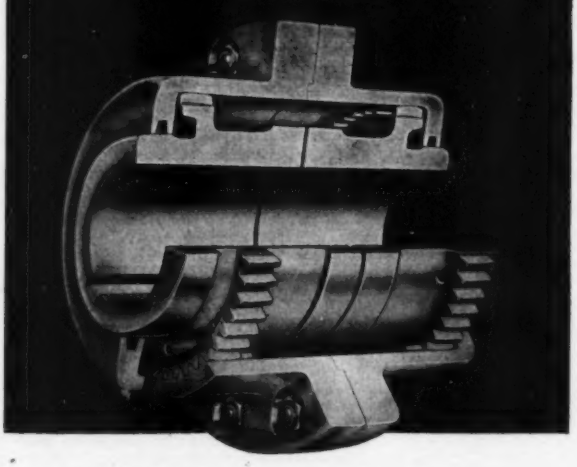

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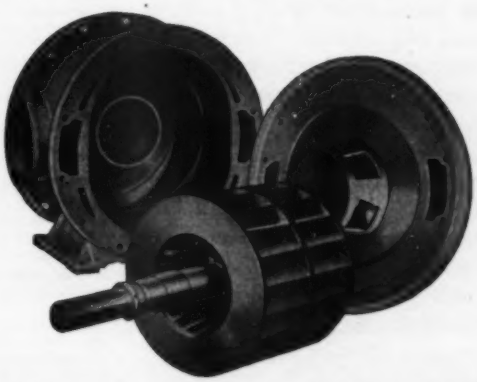

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In A Hurry?
This section offers a quick and direct method of contacting professional and business service consultants.

Dry-Type Transformers" and gives reasons why dry-type transformers are safer and less expensive to install and maintain. Types of air-cooled transformers are illustrated, including a sealed, submersible model.

Right Angle Motoreducer. Falk Corp., Milwaukee 8, Wis.—Engineering Bulletin 3110, 16 pages, provides selection information, dimensions, rating tables and service factors for the new all-steel right angle Motoreducer. With the adaptable right angle head, this Motoreducer can be used for either hoizontal or vertical applications, and is designed for a wide variety of power transmission requirements.

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Regulator-Filter. Conoflow Corp., 2100 Arch St., Philadelphia 3, Pa.—Bulletin FH-15-3 describes the Model FH-15 "Cono Airpak," a combination regulator-filter-dripwell combining the features of a reducing-relief valve and an air filter. Construction, operation, ranges, mounting and capacity are covered in the 4-page bulletin.

Water Conditioner. Cochrane Corp., 17th St. and Allegheny Ave., Philadelphia 32, Pa.—Publication No. 5001 describes the Cochrane Liquon sludge-contact reactor, a water conditioning apparatus that adds previously formed precipitates to accelerate clarification of water. The bulletin describes the operation and principle of the unit and illustrates the types of equipment available.

Mixers. Eastern Industries, Inc., 296 Elm St., New Haven 6, Conn.—Two catalogues cover the Eastern mixer line for all varieties of mixing problems. No. 500 presents full data on the portable mixers, in 12 pages. No. 600, 16 pages, gives similar engineering data on top and side entering fixed-mounting mixers. Many concise tables are given.

Strip-Chart Instruments. The Bristol Co., Waterbury 20, Conn.—Bulletin No. W1821 gives information on the new line of Series 500 Dynamaster strip-chart electronic instruments. Models covered are the regular strip-chart and pneumatic and electric-operated automatic control models.

Magnetic Mercury Cathode. Eberbach & Son Co., Ann Arbor, Mich.—A 24-page Working Manual shows where and how the "Dyna-Cath" magnetic mercury cathode apparatus can be employed. Performance data, theoretical applications, actual procedures and operating instructions and diagrams are presented. A bibliography is included.

Motorless Floor Sweeper. Handling Devices Co., Inc., 581 Boylston St., Boston 16, Mass.—4-page bulletin on the "Plantman" industrial sweeper tells advantages of this device over broom and dustpan and over powered sweepers. Specifications and prices for two models of "Plantman," the 20 inch and 28 inch sizes, are given.

Hammermills. Bauer Bros., 1759 Sheridan Ave., Springfield, Ohio—Bulletin No. H-5, 4 pages, describes the three types of hammermills made by this company, and lists special uses for each type. A crusher-feeder and a magnetic separator are also described. All essential specifications are listed.

Instruments Catalog. Wheelco Instruments Co., 847 Harrison St., Chicago 7, Ill.—This 42 page "Wheelco Data Book and Catalog" is the 1950 listing of Wheelco's standard line of thermocouples, protecting tubes, lead wire, etc., as well as special items such as resistance bulbs and wells, radiation detectors, and thermocouples for special applications. Data on making, checking and ordering thermocouples is given.

Printing Inks. National Assn. of Printing Ink Makers, 1440 Broadway, New York 18, N.Y.—"Printing Inks of Today," 12 pages, describes in generalized, feature-story fashion the various types of inks available and being developed for all printing uses. Achievements of the National Printing Ink Research Institute are also enumerated.

Pneumatic Control Transmission. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Philadelphia, Pa.—4-page Data Sheet No. 9.1-4 explains advantages of pneumatic transmission systems to central control rooms in large power plants. Principles are explained, and the safety factor is emphasized. All equipment needed is listed.

Paper Moisture Recorder. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Philadelphia, Pa.—4-page Data Sheet No. 2.9-5a fully describes the electronic "Moist-o-Graph," for continuous measurement of sheet paper moisture in multiple ranges. Operating principles and installation photographs are included.

Pump and Motor. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—Bulletin 52B6140B, titled "Electrifugal Pump," describes a close-coupled pump and motor with unit cast frame and a single shaft. Sizes from 10 to 500 gpm at heads to 220 ft. are available, and special models are described.

Liquid Rheostat. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—Bulletin 14S7544, 2 pages, explains and illustrates the Type 257 liquid rheostat for stepless, wide range speed control of wound rotor motors. Safety and efficient performance are emphasized, and operation is explained.

Insulation Resistance Testers. Associated Research, Inc., 3758 Belmont Ave., Chicago 18, Ill.—Bulletin 2A, 4 pages, describes all models of the "Vibrotest" insulation testers. These are all-electric and completely self-contained, having resistance testing ranges from 100 to 50,000 megohms, with several additional low-ohm ranges. Simplified operation is described.

Pressure Regulator Valve. C. E. Squires Co., 18502 Syracuse Ave., Cleveland 10, Ohio—Bulletin No. 102, 2 pages, describes the Class "H" pressure regulator and pump governor for steam, air and water. The simple design and patented diaphragm are featured. Prices and principal dimensions are listed.

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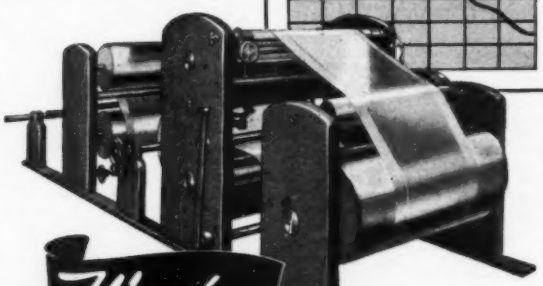

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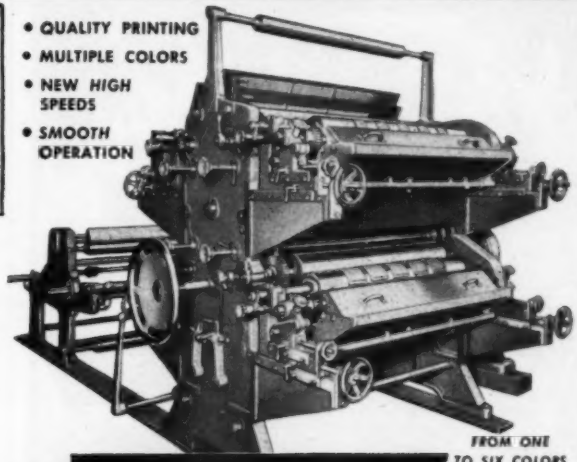

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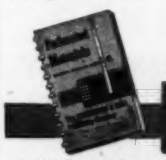

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Corduroy, Ladies'	5.75 to 6.00
Washables, No. 1	5.75 to 6.00
Percales	11.50 to 12.00
Light Prints, No. 1	11.00 to 11.50
Khaki Cuttings—	
Bleachable	10.50 to 11.00
Unbleachable	9.00 to 9.50
New White Canvas	20.50 to 21.50
Canton Flannels, bleached	20.00 to 21.00
Canton Flannels, unbleached	19.50 to 20.50
Shirt Cuttings—	
New White No. 1	20.50 to 21.50
White Shrunk	19.00 to 20.00
Silesias No. 1	13.50 to 14.00
New Unbleached	20.50 to 21.50
Fancy	9.00 to 9.50
Linen Cuttings—	
American	12.00 to 13.00
White	21.50 to 22.50
Grey	21.00 to 22.00

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No. 1	2.60 to 2.70
No. 2	2.50 to 2.60
No. 3 and 4	2.30 to 2.50
Twos and Blues—	
Repacked	4.50 to 4.75
Thirds and Blues—	
Repacked	4.00 to 4.25
Miscellaneous	3.50 to 3.75
Whites, No. 1—	
Repacked	5.25 to 5.50
Miscellaneous	4.00 to 4.25
White, No. 2—	
Repacked	4.00 to 4.25
Miscellaneous	3.50 to 3.75

RAGS (Foreign)

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NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

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OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shoppers	

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Domestic	8.00 to 8.50
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Light	7.50 to 7.75
Heavy	8.00 to 8.25
No. 1 Scrap Bagging	6.50 to 7.00
Manila Rope—	
No. 1 large	6.50 to 7.00
No. 1 small	5.50 to 6.00
Sisal Rope—	
No. 1 large	6.00 to 6.50
No. 1 small	5.50 to 6.00
New Burlap Cuttings	8.00 to 8.50
Jute Threads—	
Foreign (Nom.)	7.50 to 8.00
Domestic	7.50 to 8.00
Strings—	
No. 1 sisal	5.50 to 5.75
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Soft jute	5.25 to 5.50
Mixed	3.50 to 3.75

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Hard White, No. 1	170.00—
Soft White, No. 1	140.00—
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Fly Leaf, No. 1	80.00—
Fly Leaf, Woody No. 1	60.00—
No. 2 Mixed Col. Woody	50.00—
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	55.00—
Mixed Books	30.00—
Ledger Stock—	
No. 1 White	115.00—
No. 1 Mixed (Colored)	90.00—
Manilas—	
New Env. Cuttings	125.00—
New Env. Cuts, One-Cut	—
Extra Manilas	75.00—
Manila Tab Cards, Free of Ground Wood	140.00—
Colored Manila Tab Cards	100.00—
Kraft—	
New Envelope Cuttings	145.00—
Tripled Sorted No. 1 100%	90.00—
No. 1 Old Assorted	70.00—
News—	
White Blank	120.00—
Overissue	42.00—
No. 1 Folded	34.00—
Old Corrugated Containers	55.00—
New Jute Corrugated Cuts	56.00—
Mill Wrappers	32.00—
Box Board Chips	30.00—
No. 1 Mixed Paper	30.00—

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Alum (Papermakers)—		
Lump, cwt.	4.05—	
Ground, cwt.	3.80—	
Powdered, cwt.	4.20—	
Blanc Fixe—		
Pulp, bulk, ton	80.00—	
Dry, barrels	85.00—	
Bleaching Powder—		
Drums, cwt.	5.00 to	6.00
Casein (Domestic Standard)		
20-30 mesh (bags), lb.		
80-100 mesh (bags), lb.	38.00 to	40.00
Argentine, lb.	36.00 to	37.00
China Clay—		
Domestic Filler		
Bulk (mine) ton	10.00 to	15.00
Domestic Coating		
Bulk (mine) ton	15.00 to	25.00
Imported (ship side)		
Bulk (lump) ton	22.00 to	30.00
Chlorine—		
Tank cars (wks) cwt.	2.80 to	2.95
Gelatine (silicin), lb.	1.35 to	1.35
Glyc. (C.P.) drums, lb.	.50 to	.55
Litharge, powd. bbl. lb.	.17¾ to	.18¾

Rosin (Gum)—	New York, per 100 lbs.
E	9.50—
F	9.50—
G	9.70—
WW	10.25—
Rosin (Wood), carlots, F.O.B. South	6.80—

MARKET QUOTATIONS

Salt Cake—
Dom. bulk (wks) ton..... 22.00 to 24.00
Imp. bulks on dock—
(Atl. ports) ton (Nom.) 25.00—

Soda Ash—
Bulk (works) cwt..... 1.20—
Paper bags, cwt..... 1.50—

Soda (Caustic)—
Solid drums, cwt..... 3.35 to 3.40
Ground and flake, drums, cwt. ..... 3.75 to 3.85

Sodium Silicate—
60 deg. 55 gal. drums, (works) cwt..... 1.55 to 1.75
40 deg. 35 gal. drums, (works), cwt..... 1.20 to 1.35

Starch—
Pearl, 140 lb. bags, cwt... 5.72—
Pearl, barrels, cwt..... 5.72—
Paper (Sp.) bags, cwt..... 5.72—
Powdered, barrels, cwt... 5.83—

Sulphur (Crude)
(Mine) bulk, long ton.... 22.00—

Talc—
Dom. 100 lb. bags (mine) ton ..... 25.00 to 28.00
Canadian ..... 35.00 to 45.00

Titanium Dioxide—
Barium Pig. bbls., lb..... .21 to .21½
Calcium Pig. bbls., lb..... .21 to .21½
Zinc Sulphide, bbls., lb..... 11.50 to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, with inland freight allowed, are:

Bleached sulphite, Swed...175.00—
Bleached sulphite, Finnish —
Bleached sulphite, dom.....135.00—
Easy bleaching sulphite..... —
Unbleached kraft, Finn..... —
Unbleached sulphite, Swed.153.00—
Unbleached sulphite, Fin... —
Unbleached sulphite, dom.140.00—
Unbleached kraft, Swed...153.00—
Unbleached kraft, northern 140.00—
Unbleached kraft, southern 140.00—
Bleached sulphate, Swed...180.00—
Bleached soda, domestic.....140.00—
Sulphite screenings, dom... 40.00 to 56.00
Groundwood, domestic and Canadian ..... 85.00 to 100.00

PAPER

f.o.b. New York City

Boards— per ton
Binders .....135.00—
Chip .....100.00 to 105.00
Chip, tube and can.....110.00—
Chip, full blending.....112.50—
Chip, sgl. mla. lined.....125.00—
Coated, white patent
.016 .....155.00—
.020 and heavier.....145.00—
Kraft liner.....115.00—
Filled News.....102.50 to 107.50
Container .....120.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)
Uncoated (Untrimmed)

Book, White (M. F.)—
A Grade E. F..... 17.40—
B Grade E. F..... 17.65—
A Grade S. C..... 18.15—
B Grade S. C..... 18.40—
No. 2 Uncoated Offset 4 sides, White..... —

Machine Coated White
No. 1 Glossy..... 23.40—
No. 2 Glossy..... 21.90—
No. 3 Glossy..... 21.15—
No. 4 Glossy..... —
No. 2 Offset..... 17.90—
ClS Litho (Varnish)..... —
ClS Litho (Non-Varnish) —

Writing Papers—f.o.b. mill with some, quantity, packing and other differentials allowed:

Rag Content Bond—
(In Ton Lots)
per cwt.
Extra 100% Rag..... 70.45—
100% Rag..... 62.45—
75% Rag..... 48.15—
50% Rag..... 38.90—
25% Rag..... 31.65—

Rag Content Ledger—
(In Ton Lots)
per cwt.
Extra 100% Rag..... 72.65—
100% Rag..... 63.90—
75% Rag..... 49.40—
50% Rag..... 40.20—
25% Rag..... 33.00—

Sulphite Bond—
per cwt.
Air dry, watermarked..... —
No. 1 watermarked..... 19.05—
No. 2 watermarked..... 18.10—
No. 4 watermarked..... 17.10—

Sulphite Ledger—
per cwt.
No. 1 watermarked..... 21.15—
No. 2 watermarked..... 21.00—
No. 4 watermarked..... 20.40—

Glassine (f.o.b. mill)—
per cwt.
Embossed (25 lb. up)..... —
Bleached (25 lb. up)..... —
Unbleached (25 lb. up).. —

Greaseproof—
Bleached (25 lb. up).... —
Unbleached (25 lb. up) —

News—
per ton
Rolls, Standard (Contract) .....100.00 to 110.00
Rolls (Spot)..... (Nominal)
Sheets .....120.00—

Tissues (Carlots)—
per ream
White No. 1..... 1.85—
White No. 2..... 1.65—
Bleached Anti-Tarnish.... —
Colored ..... —
Anti-Tarnish Kraft..... 1.70—
Manila ..... 1.85—
Napkins, semi-crepe (12½ lb. to M shts.) per cs..... .90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs..... .90—
Toilet, Bleached (M shts.) per cs..... 7.10—
Toilet, Unbleached (M shts.) per cs..... 6.05—

Towels
per ream
Bleached ..... 6.65—
Unbleached ..... 5.65—

Wrappings (Kraft)—
per cwt.
Super-Standard ..... 9.25 to 9.50
No. 1 Wrapping..... 8.25 to 8.50
Standard Wrapping..... 7.75 to 8.00
Standard Bag..... 7.50 to 7.75
Variety Bag..... —

Wrappings (Sulphite and Bleached Kraft)—
(Rolls, f.o.b. mill)

Bleached Papers—
per cwt.
M.F. & M.G. Waxing, 20 lb. (carloads only) —
(10,000 lb.)..... —
Drug wrapp., 35 lb... —

Unbleached Papers
Com. Gr. Butch. 40 lb.
No. 1 Butchers..... —
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb..... —
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb..... —
Steam Finish, 50 lb... —
Water Finish, 50 lb... —

Manilas—
Envp. Mla., Sub. 16-40 (No. 1)..... —
Env. Mla., Sub. 16-28 (No. 2)..... —
Envp. Mla. (Prices based on large sheets untrimmed ream marked, in bdls.)..... —

Wrapp. Mla. 35 lb. up—
No. 1..... 9.00—
No. 2..... —

M.G. Sulphite and Kraft (other than Waxing)
Grade B-20 lb..... —
Grade A-22 lb..... —

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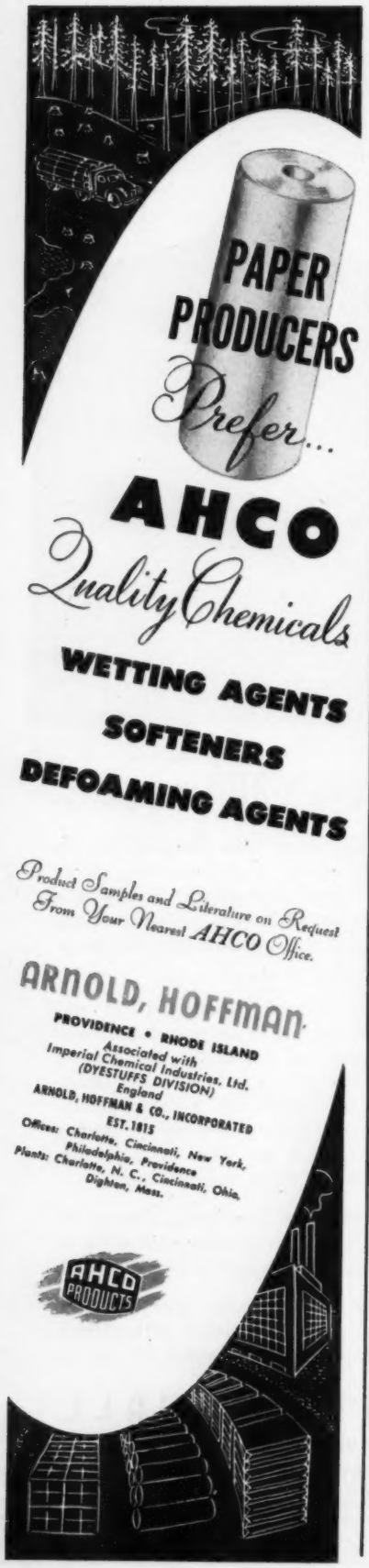

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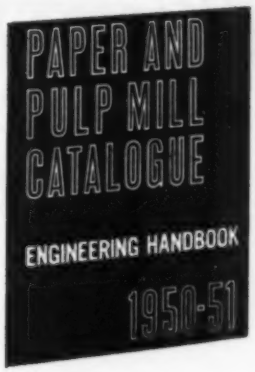

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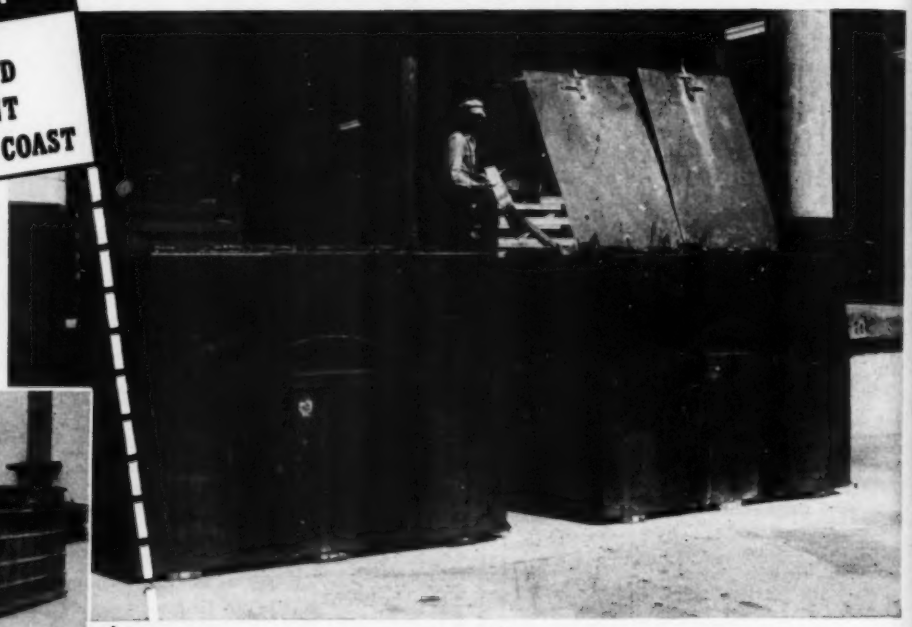

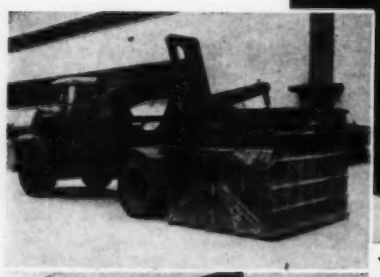

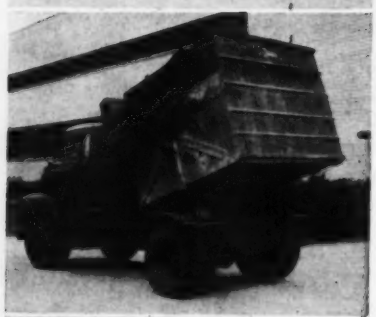

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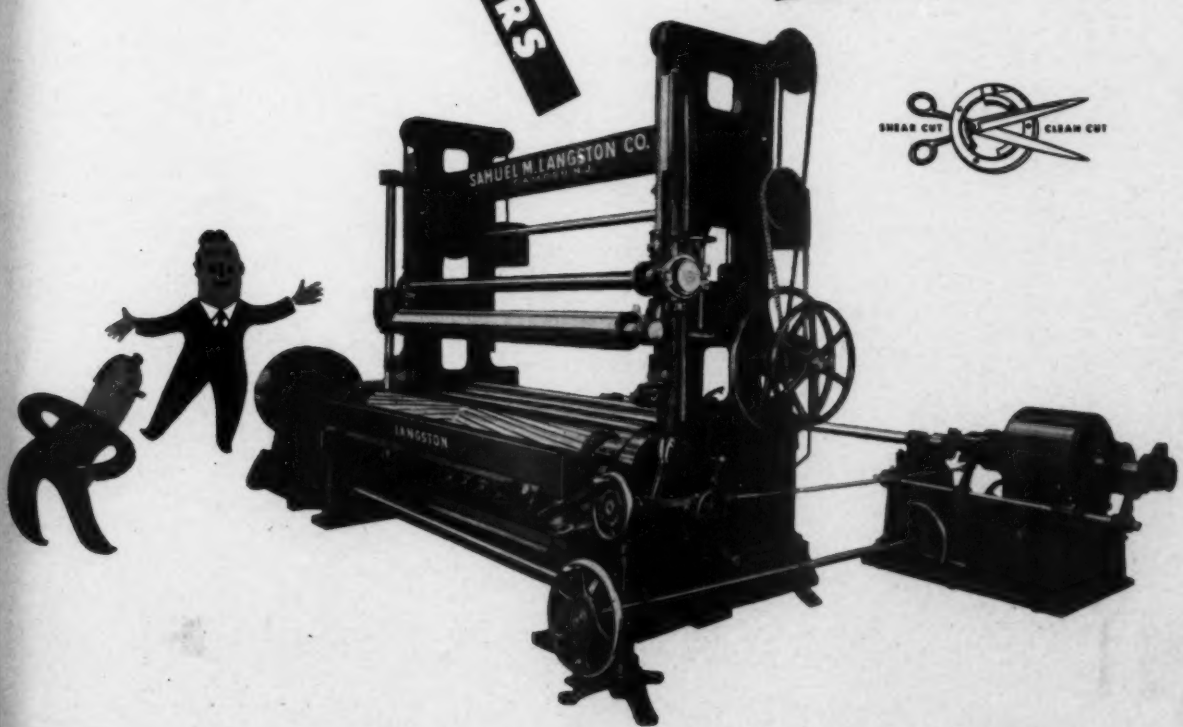

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